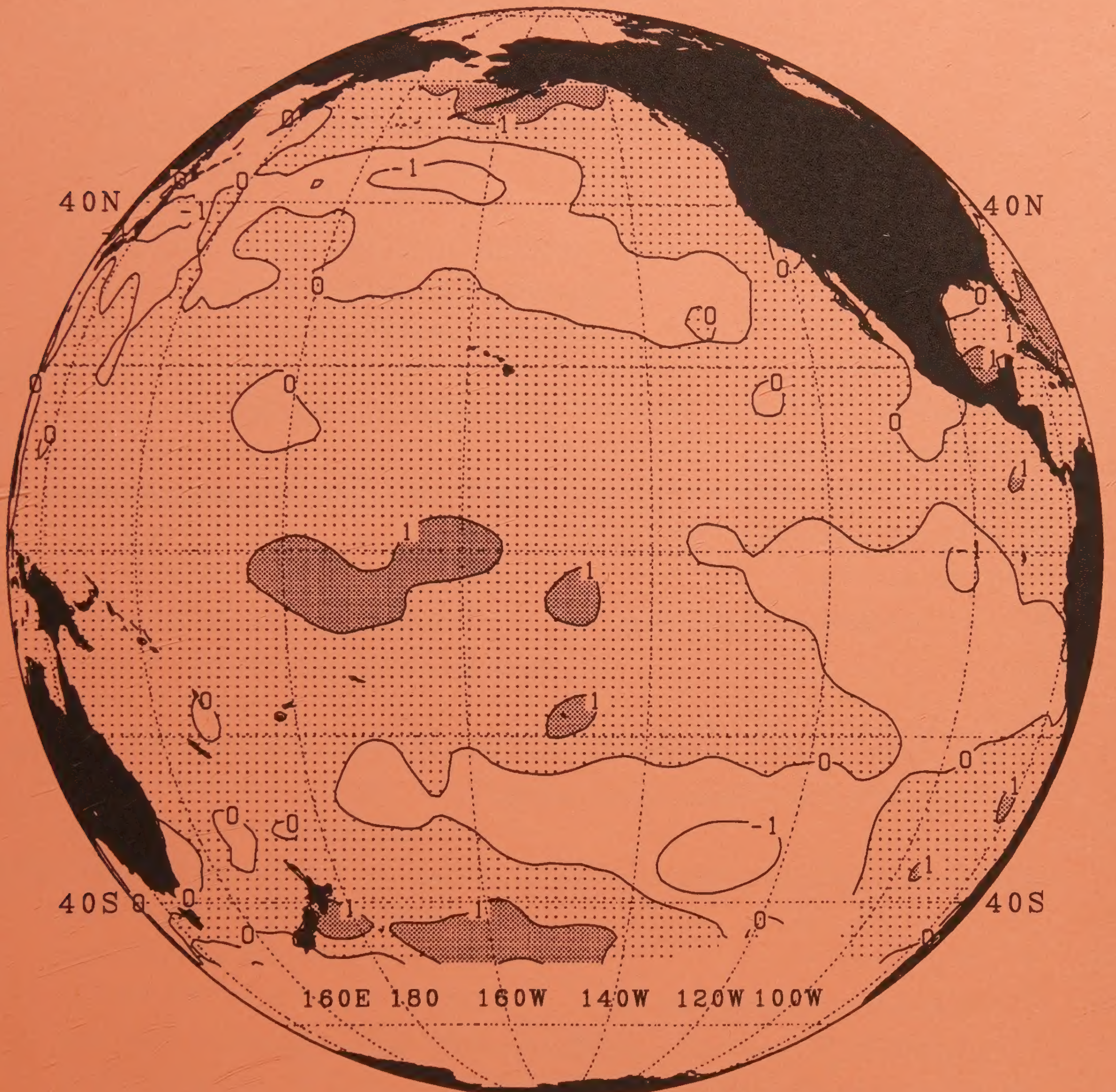
気象庁海洋月報

Monthly Ocean Report
March 2003 (No. 123)



Climate and Marine Department

Japan Meteorological Agency

気象庁 気候・海洋気象部

平成15年3月

気象庁海洋月報は、気象庁 気候・海洋気象部 海洋気象情報室で作成しています。
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Monthly Ocean Report is prepared by the Office of Marine Prediction, Climate and Marine Department, Japan Meteorological Agency.

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表紙は、2003 年 3 月の太平洋の月平均海面水温偏差図です。
陰影部は、平年より高温の海域を示しています。

The figure on the front cover shows the monthly mean SST anomalies for March 2003 in the Pacific Ocean.
Areas of positive anomalies are shaded.

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海況の特徴（２００３年３月）

日本近海の海況

海面水温は、九州の東、千島列島周辺から北海道の南にかけて、および三陸沖から常磐沖にかけて平年より1℃以上低く、37°N、145°E付近の海域では－2℃を超える負偏差が見られた（図４）。

黒潮は、九州南東で離岸し、紀伊半島に接岸した後、東海沖を東に流れ、三宅島付近を通過した後、房総半島沖を北東に流れていた（図９）。

太平洋の海況

太平洋赤道域の海面水温は、160°Eから140°Wにかけて平年より0.5℃以上高く、175°Eから155°Wにかけては平年より1℃以上高かった。一方、105°Wから100°Wにかけてと120°W 付近では平年より0.5℃以上低かった。

北太平洋の海面水温は、アラスカ湾付近で平年より1℃以上高かった。一方、45°Nに沿う日付変更線から160°Wにかけては－1℃を超える負偏差が見られた（図１７）。

Highlights March 2003

Seas adjacent to Japan

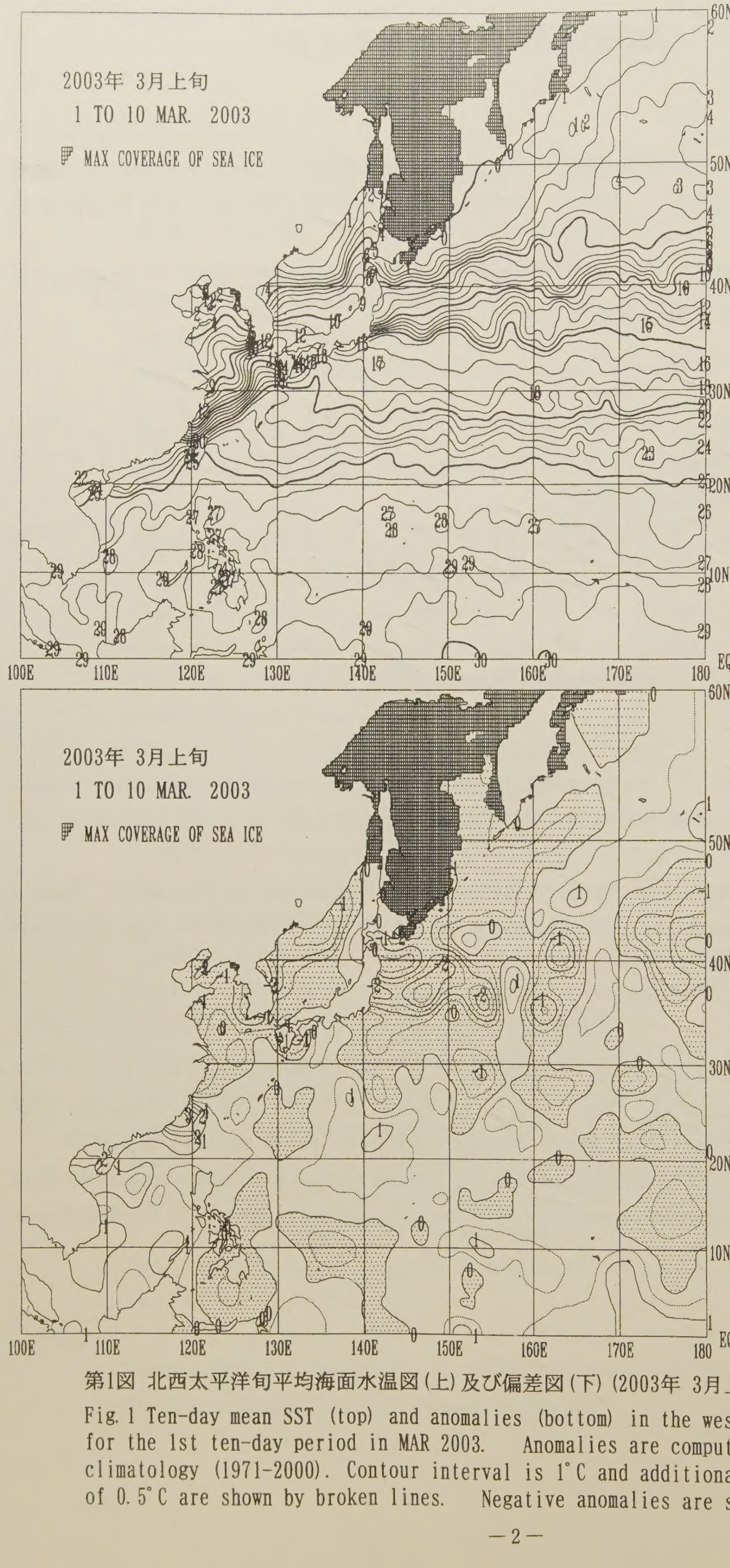
SSTs were more than 1℃ below normal in the seas east of Kyushu, from the Kuril Islands to south of Hokkaido, and from off Sanriku to off Joban. Negative SST anomalies exceeding -2℃ were found in the seas around 37°N, 145°E (Fig. 4).

The Kuroshio flowed off southeast of Kyushu and close to the Kii Peninsula. Then it flowed eastward off Tokai, passed near Miyake Island and flowed NE-ward off the Boso Peninsula throughout the month (Fig. 9).

Pacific Ocean

In the equatorial Pacific, SSTs were more than 0.5℃ above normal from 160°E to 140°W. Positive SST anomalies exceeding +1℃ were found from 175°E to 155°W. Negative SST anomalies exceeding -0.5℃ were found in the seas from 105°W to 100°W and around 120°W.

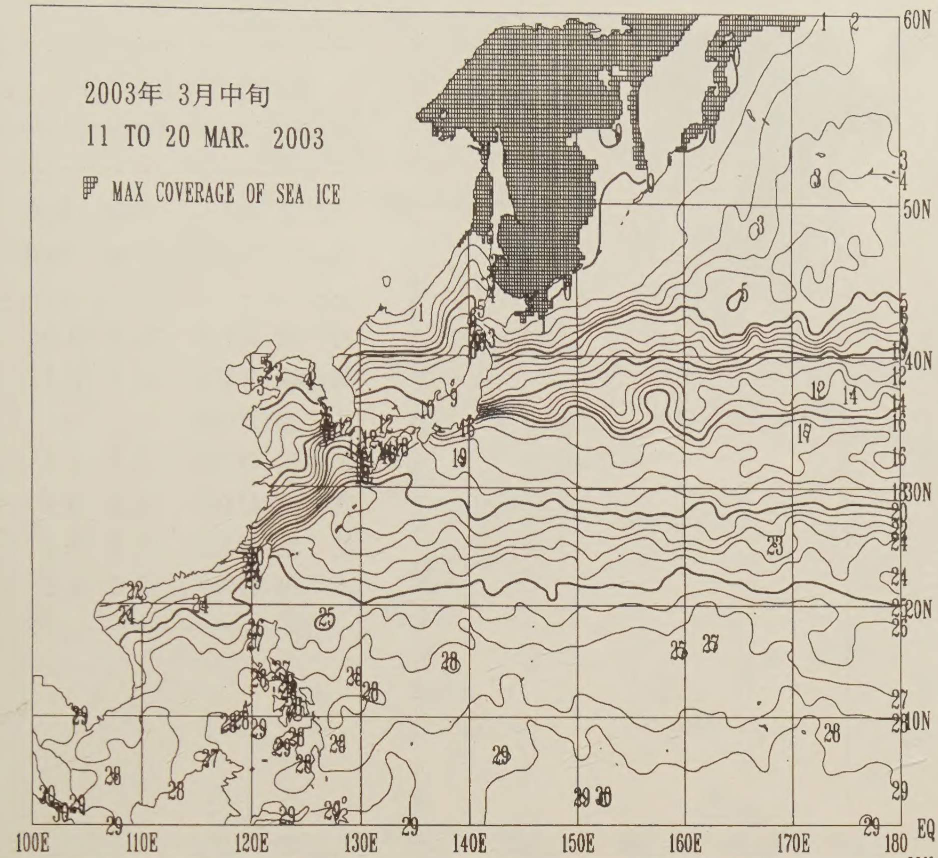
In the North Pacific, SSTs were more than 1℃ above normal in the seas around the Gulf of Alaska. Negative SST anomalies exceeding -1℃ were found in the seas from the date line to 160°W along 45°N (Fig. 17).



旬平均沿岸水温(℃) Coastal Water Temperature		
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	22.0	0.3
御前崎(47655)	12.3	0.9
八丈島(47678)	-	-
小名浜(47598)	7.4	-1.6
宮　古(47585)	6.4	0.0
江　差(47428)	5.6	-0.2
浜　田(47755)	12.1	0.3

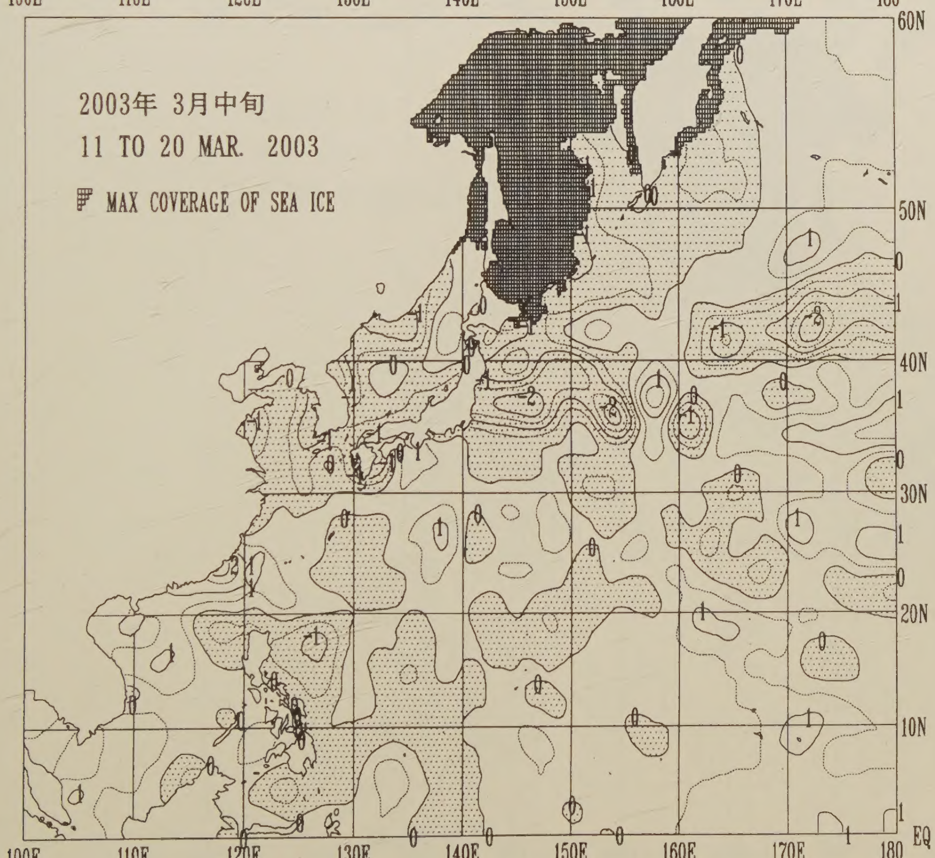
第1図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2003年 3月上旬)

Fig. 1 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 1st ten-day period in MAR 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



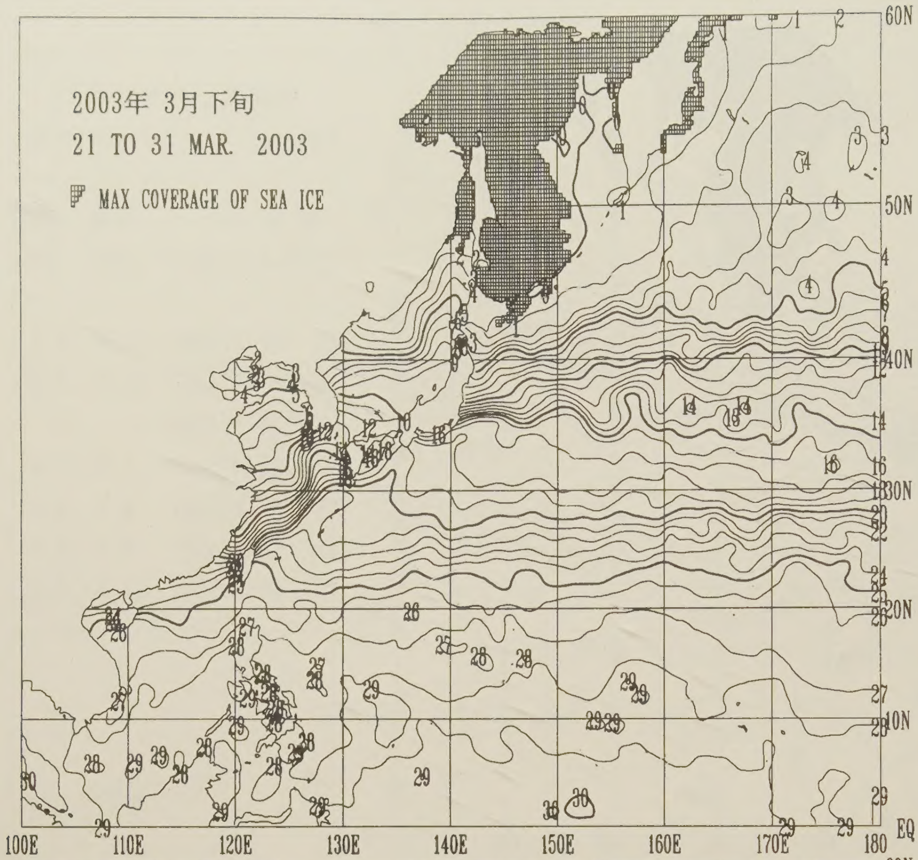
旬平均沿岸水温(℃)
Coastal Water Temperature

地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	22.0	-0.4
御前崎(47655)	12.6	0.4
八丈島(47678)	-	-
小名浜(47598)	7.3	-1.7
宮　古(47585)	6.7	0.5
江　差(47428)	5.2	-0.9
浜　田(47755)	12.5	0.1

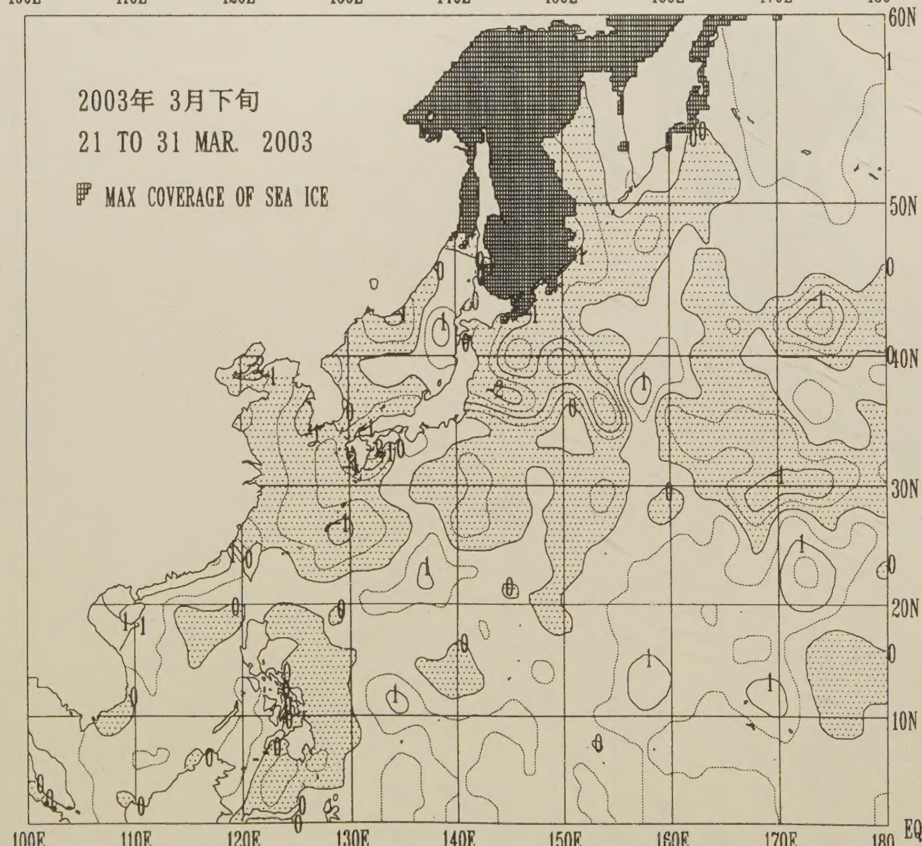


第2図 北西太平洋旬平均海面水温図(上)及び偏差図(下)(2003年 3月中旬)

Fig. 2 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 2nd ten-day period in MAR 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

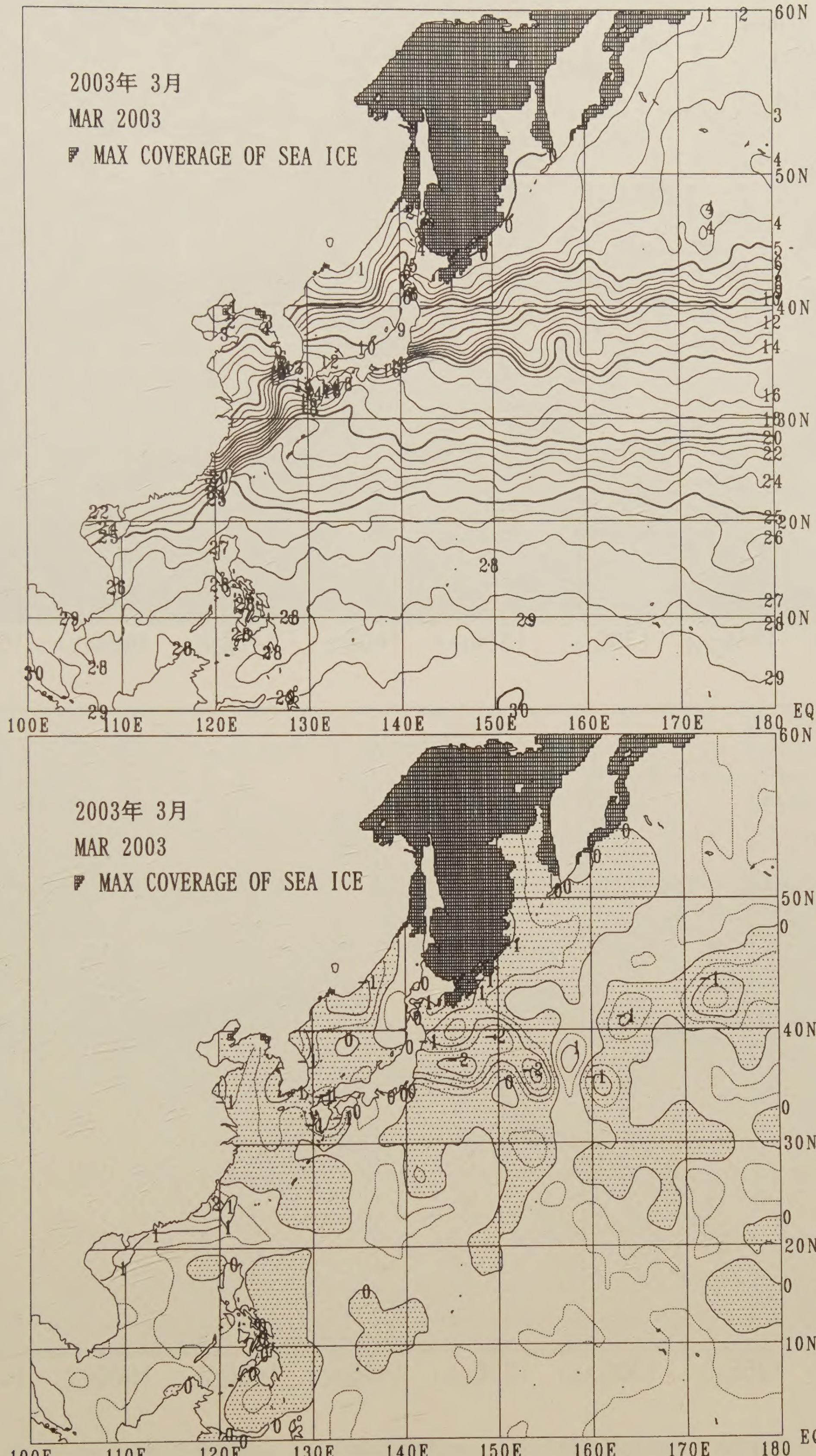


旬平均沿岸水温(℃) Coastal Water Temperature		
地点名 (Index Number)	水温 Temp.	偏差 Anom.
石　垣(47918)	22.4	-0.5
御前崎(47655)	13.4	0.4
八丈島(47678)	-	-
小名浜(47598)	7.8	-1.3
宮　古(47585)	6.6	0.4
江　差(47428)	6.9	0.2
浜　田(47755)	13.0	0.1



第3図 北西太平洋旬平均海面水温図(上)及び偏差図(下) (2003年 3月下旬)

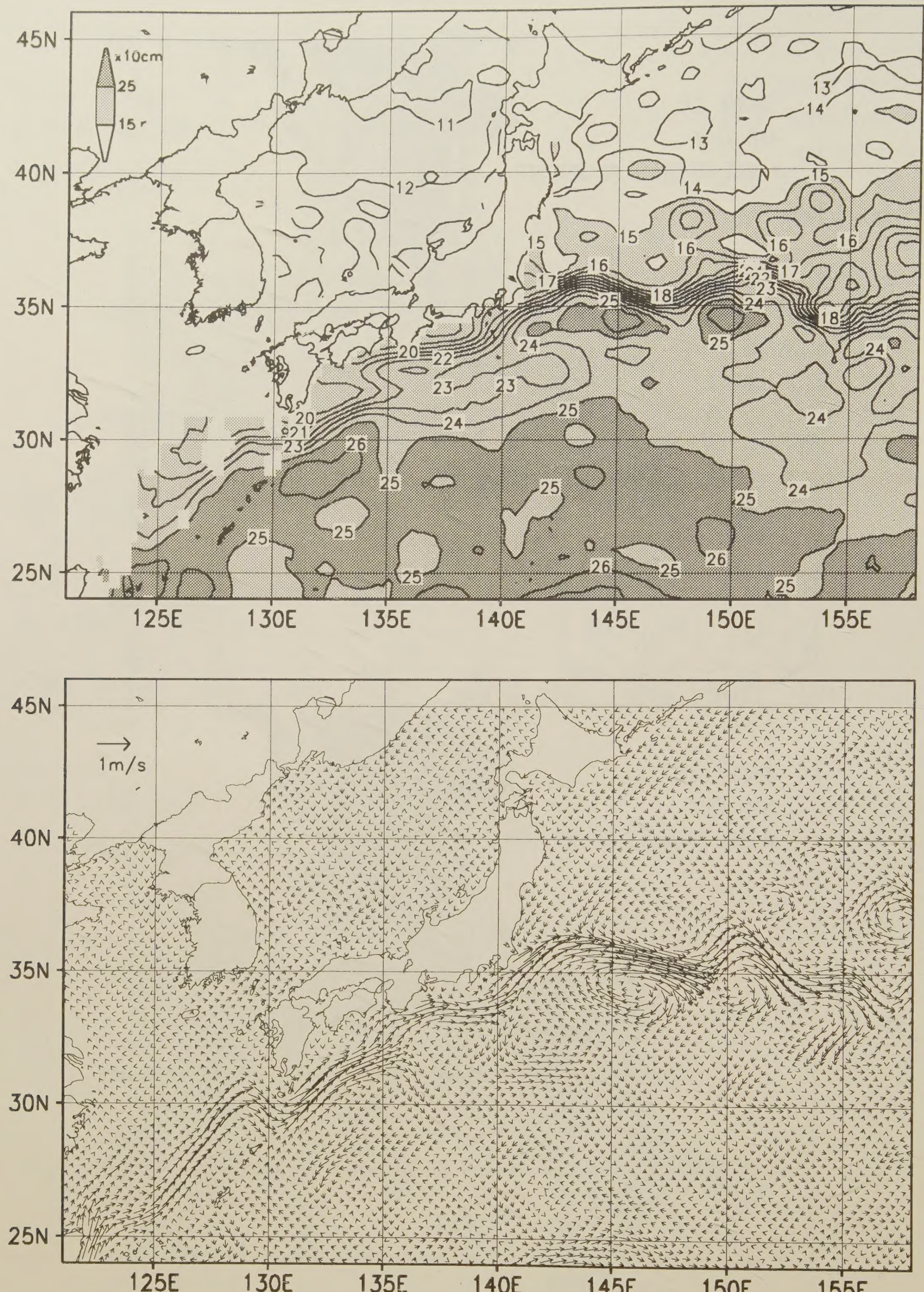
Fig. 3 Ten-day mean SST (top) and anomalies (bottom) in the western North Pacific for the 3rd ten-day period in MAR 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.



第4図 北西太平洋月平均海面水温図(上)及び偏差図(下)(2003年 3月)

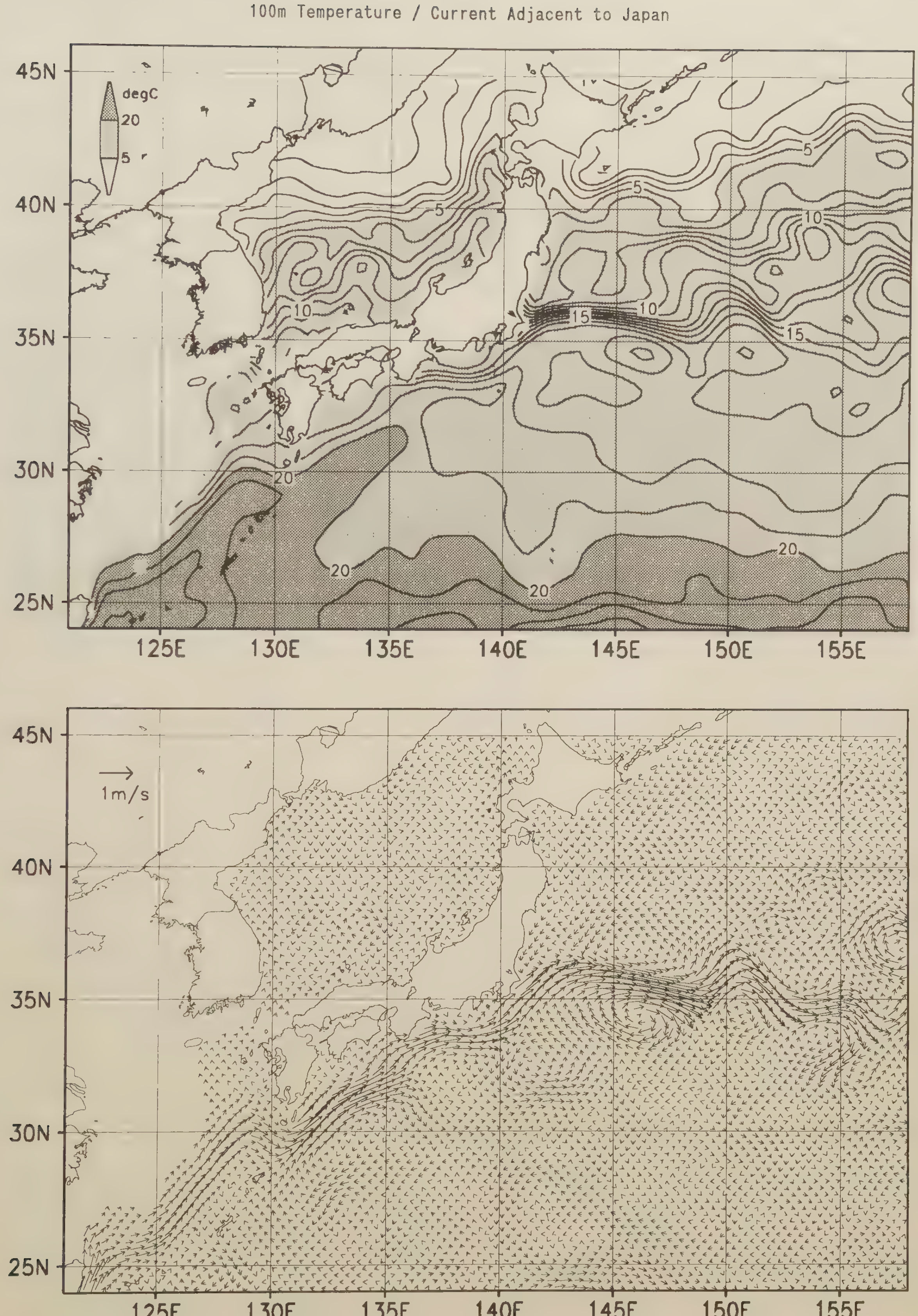
Fig. 4 Monthly mean SST (top) and anomalies (bottom) in the western North Pacific for MAR 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C and additional anomaly contours of 0.5°C are shown by broken lines. Negative anomalies are spotted.

Dynamic Height / Sea Surface Current Adjacent to Japan



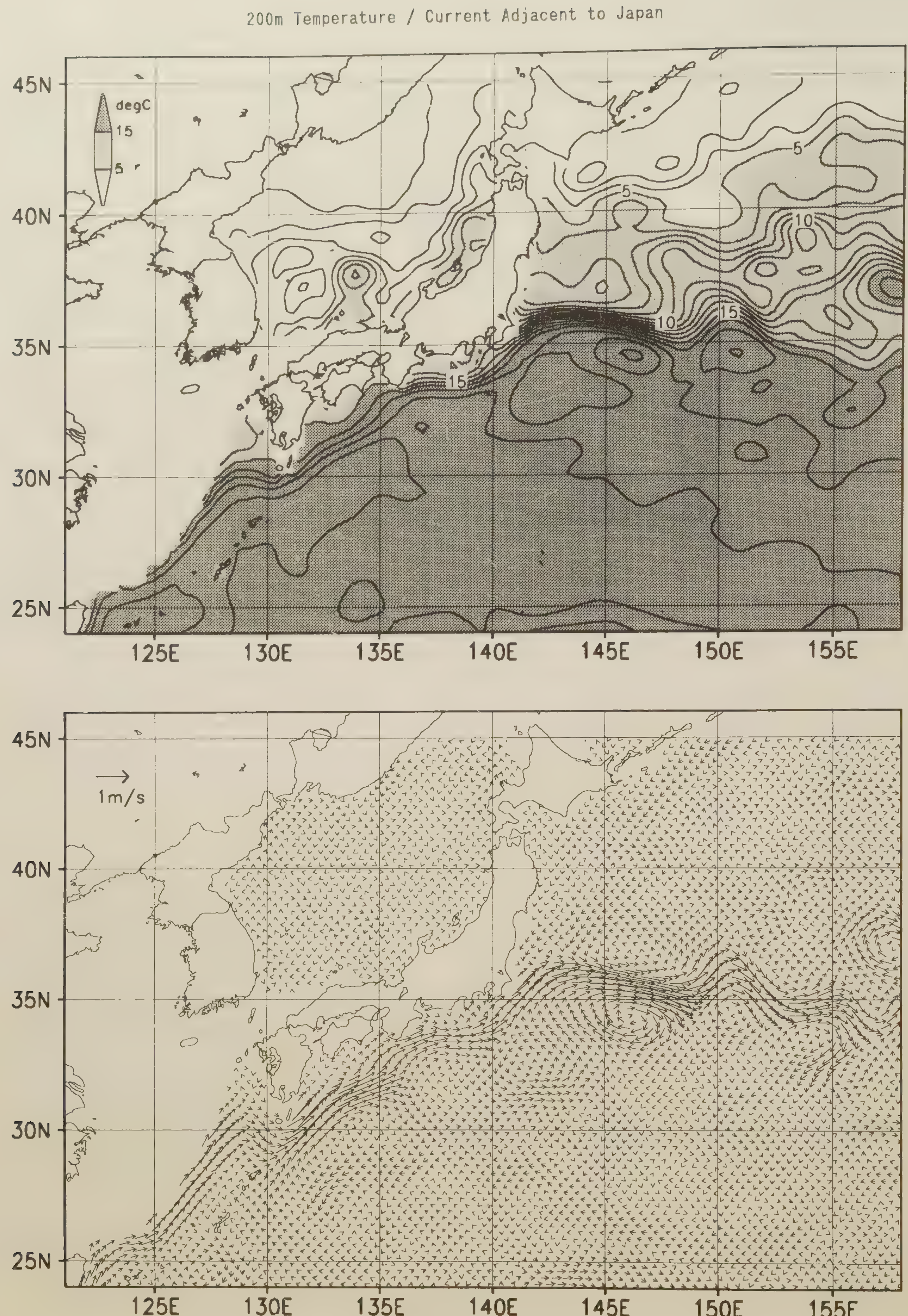
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（海洋総合解析システムによる）

Fig. 5　Monthly mean sea surface height (top) and current (bottom) in seas adjacent to Japan for March 2003. Contour interval is 10cm (top). (calculated by the Ocean Comprehensive Analysis System)



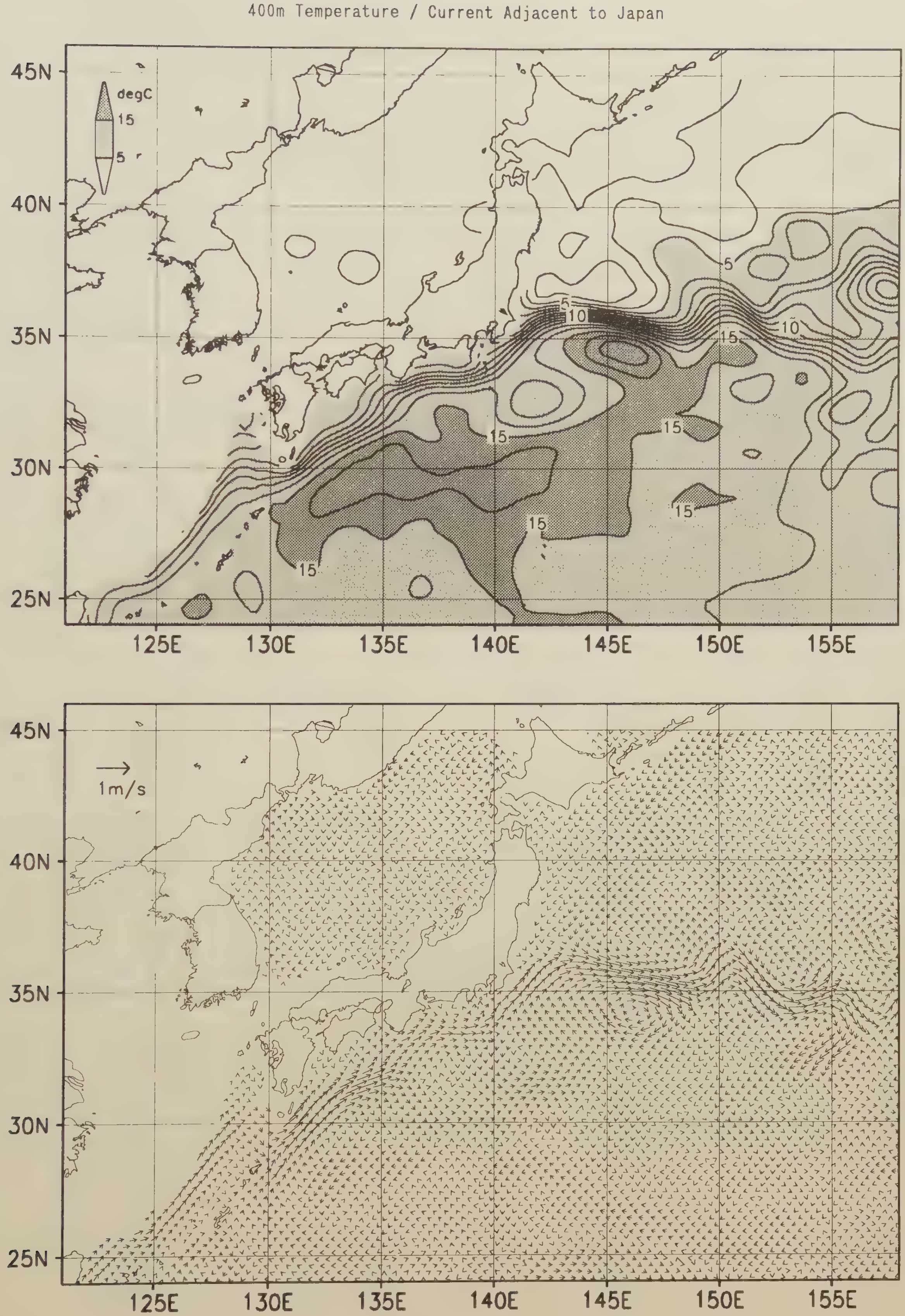
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（海洋総合解析システムによる）

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Fig. 7　Monthly mean subsurface (200 m) temperature (top) and current (bottom) in seas adjacent to Japan for March 2003. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



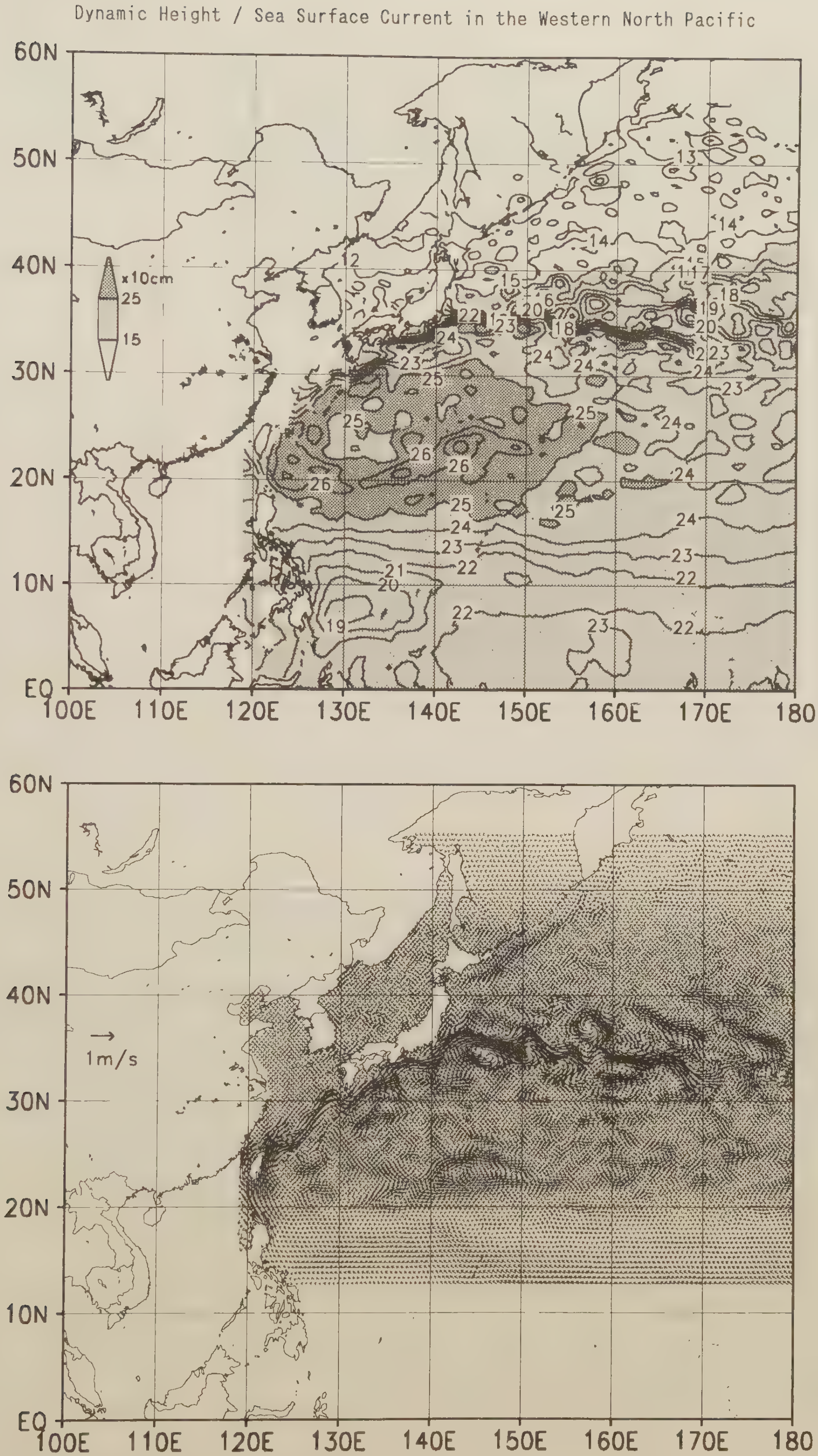
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（海洋総合解析システムによる）

Fig. 8　Monthly mean subsurface (400 m) temperature (top) and current (bottom) in seas adjacent to Japan for March 2003. Contour interval is 1 ℃ (top). (calculated by the Ocean Comprehensive Analysis System)



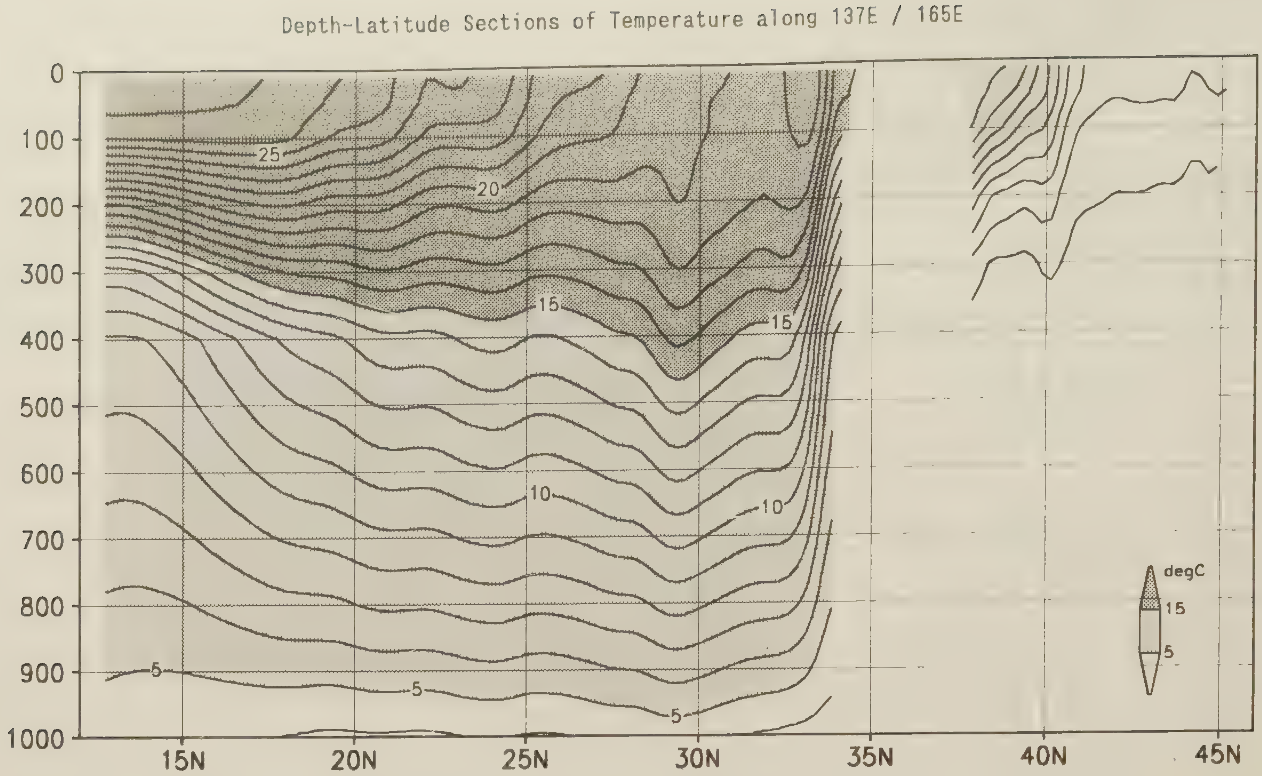
第9図 旬別黒潮流軸図

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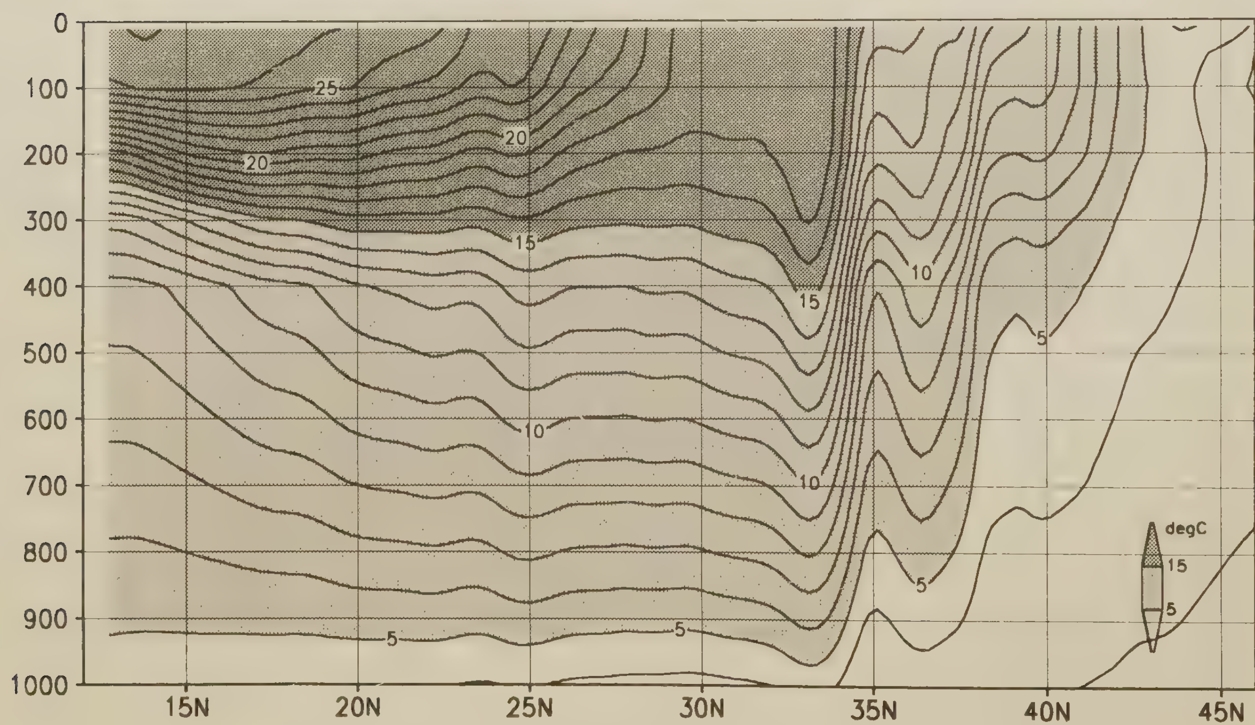
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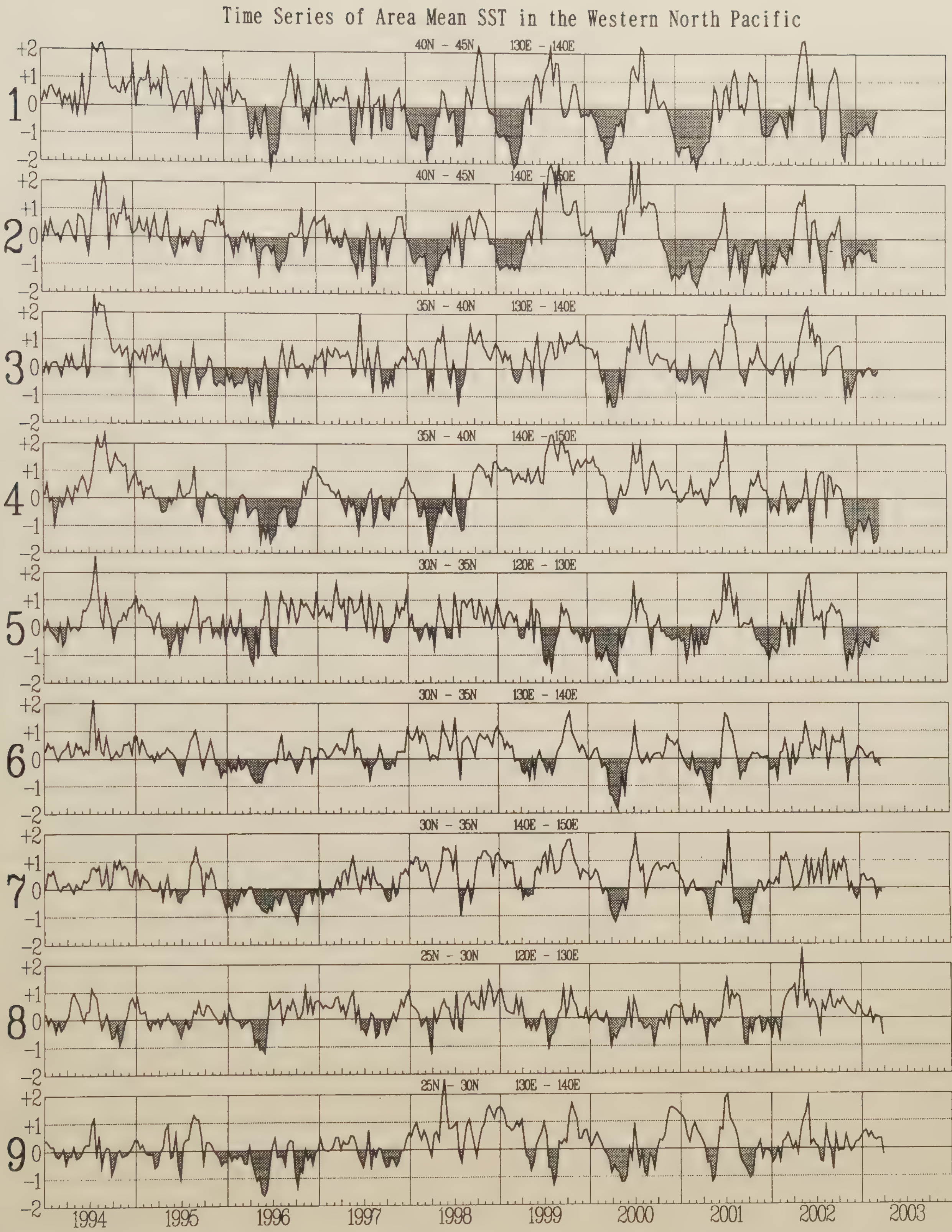
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（海洋総合解析システムによる）

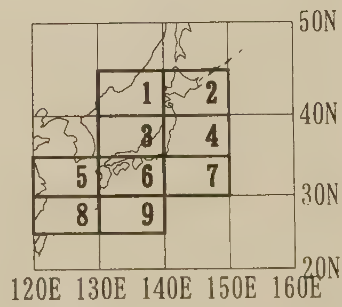
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（海洋総合解析システムによる）

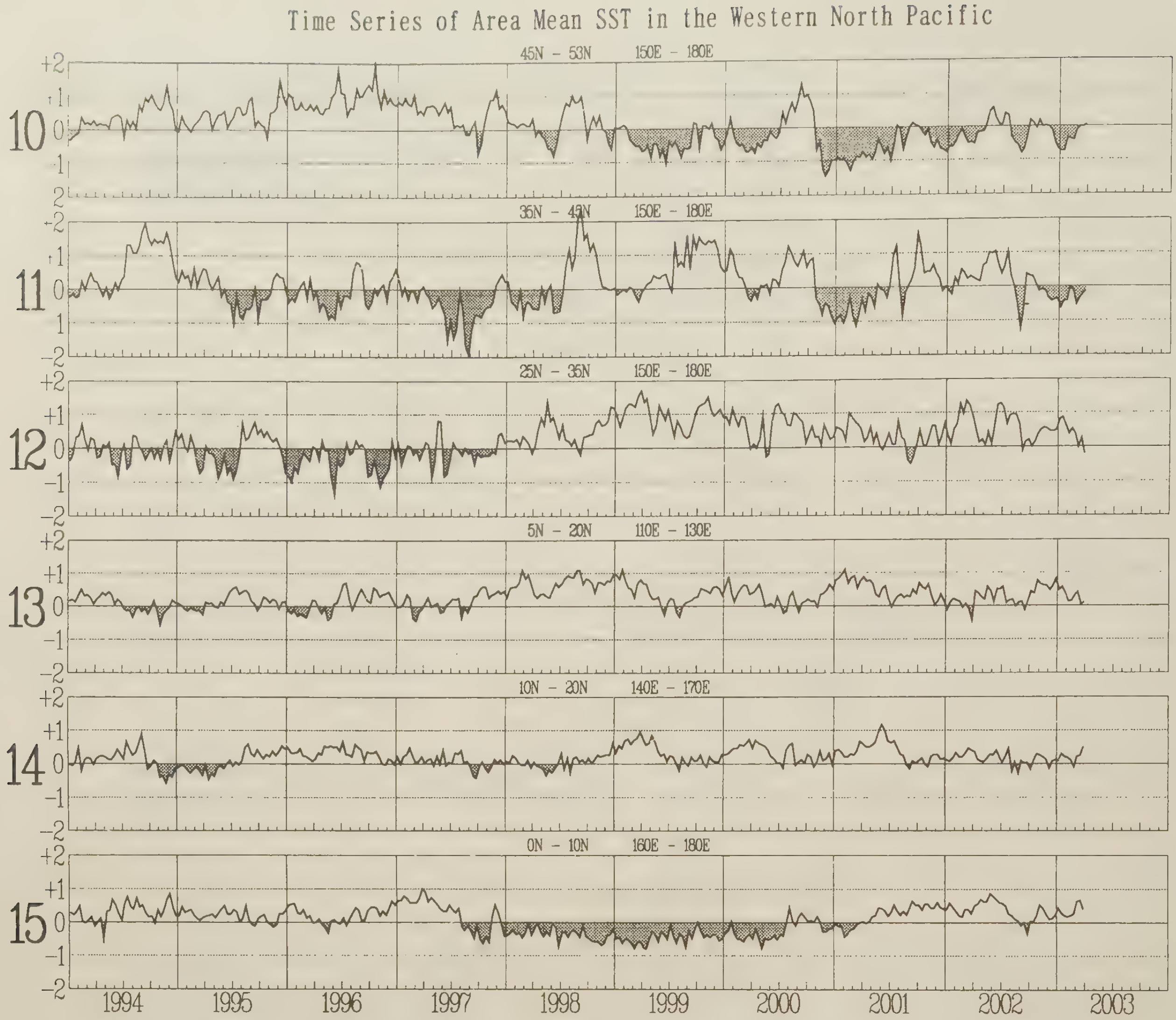
Fig. 12　Vertical cross section of monthly mean temperature along 165 °E for March 2003. Contour interval is 1 °C. (calculated by the Ocean Comprehensive Analysis System)





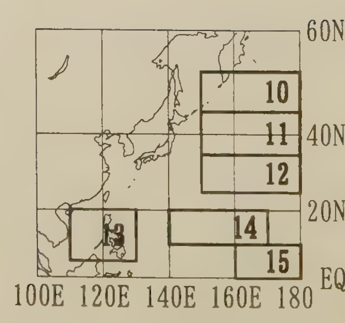
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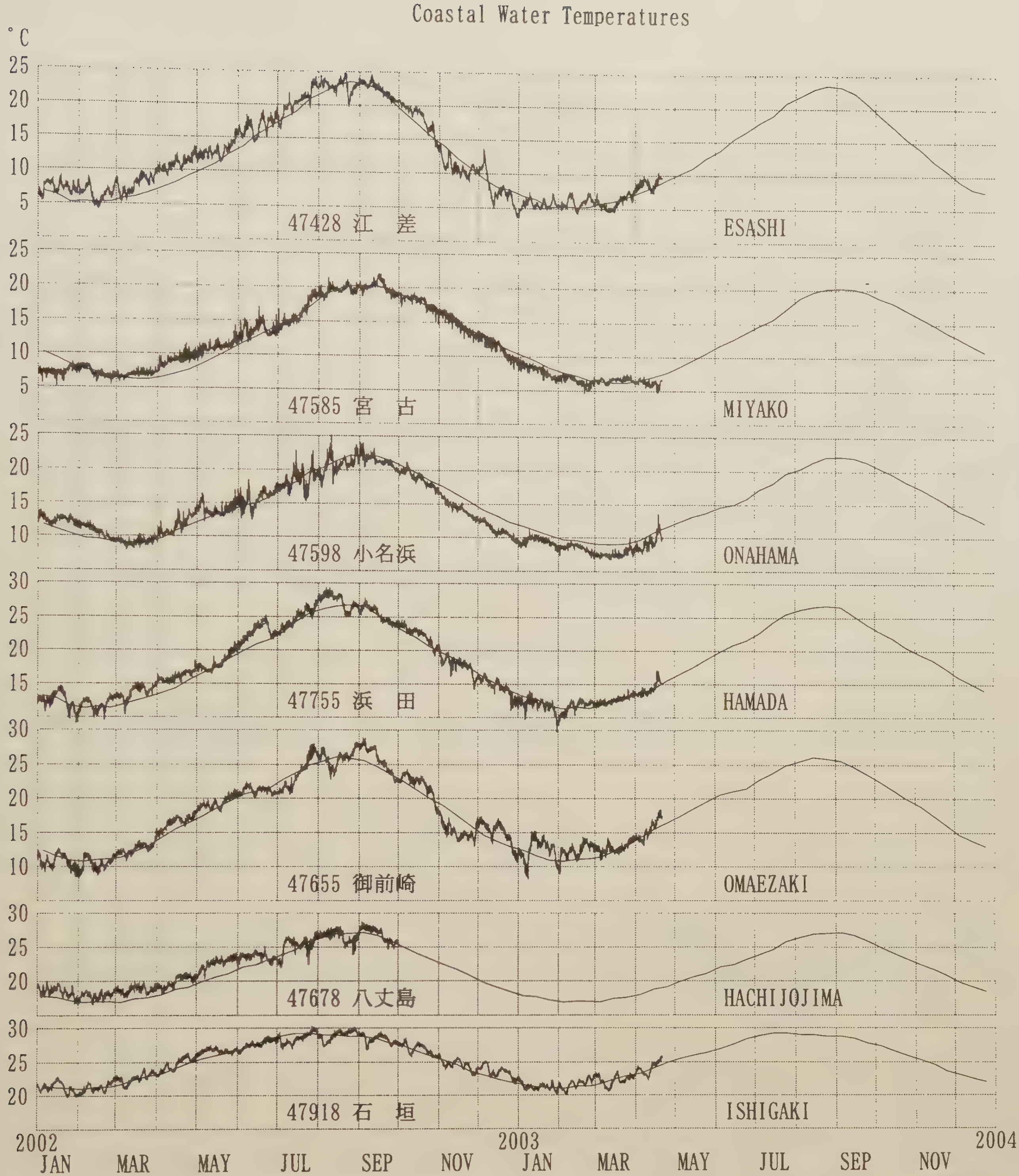
Fig. 13 Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).



第13図　海域別旬平均海面水温平年偏差時系列図（つづき）

Fig. 13 (continue) Time series of the ten-day mean SST anomalies (°C) in the western North Pacific for the areas shown in the right panel. Negative anomalies are shaded. Anomalies are computed from the JMA climatology (1971-2000).



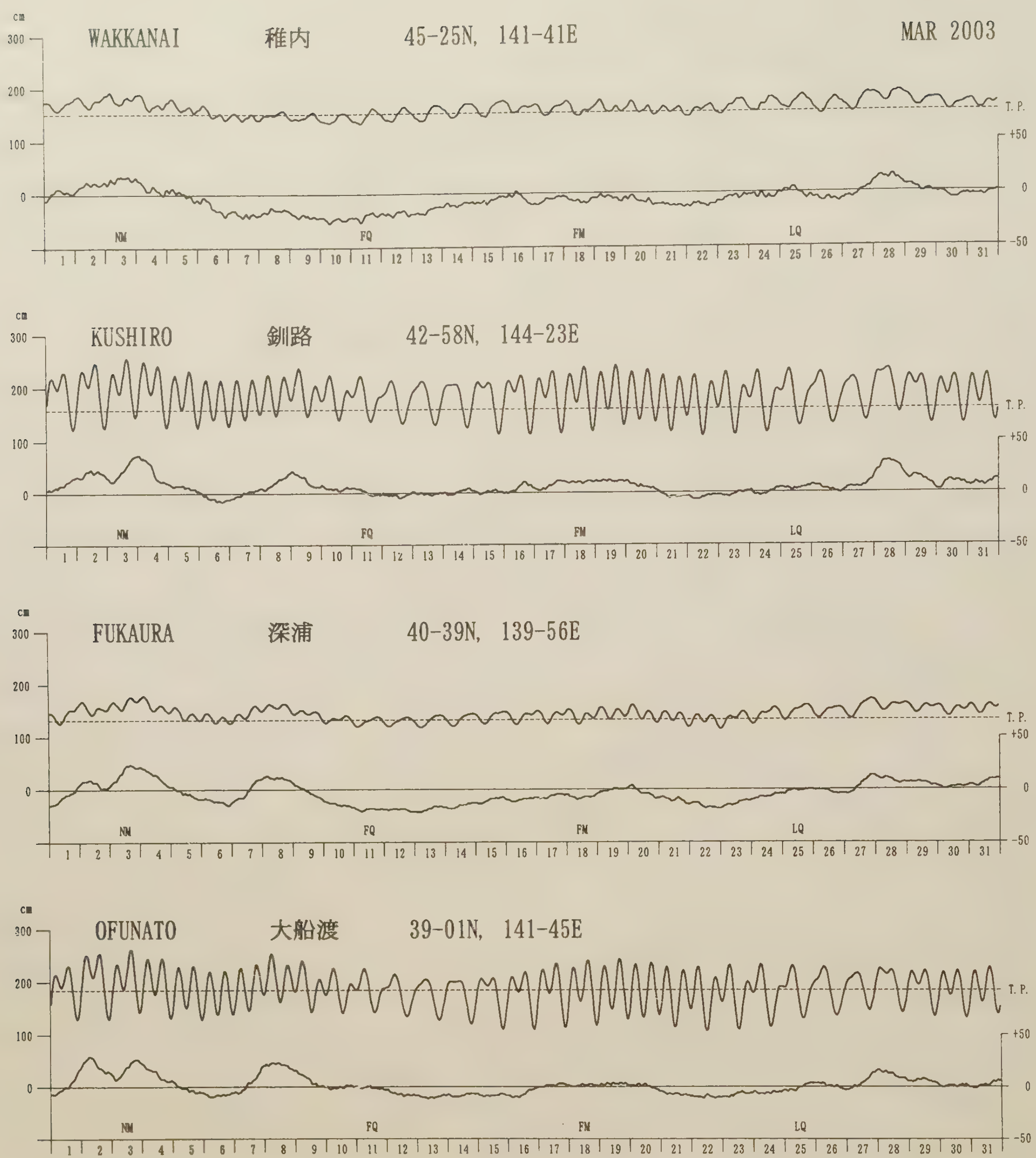


第14図 沿岸水温時系列図

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Thin lines show ten-day mean climatology.



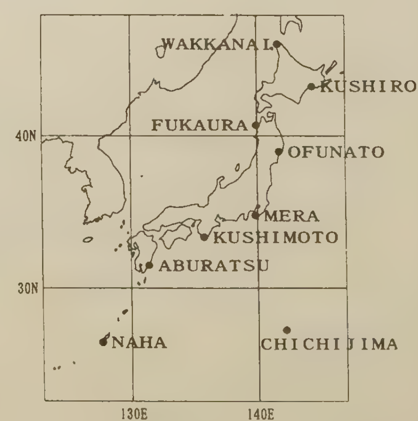
Time Series of Sea Level

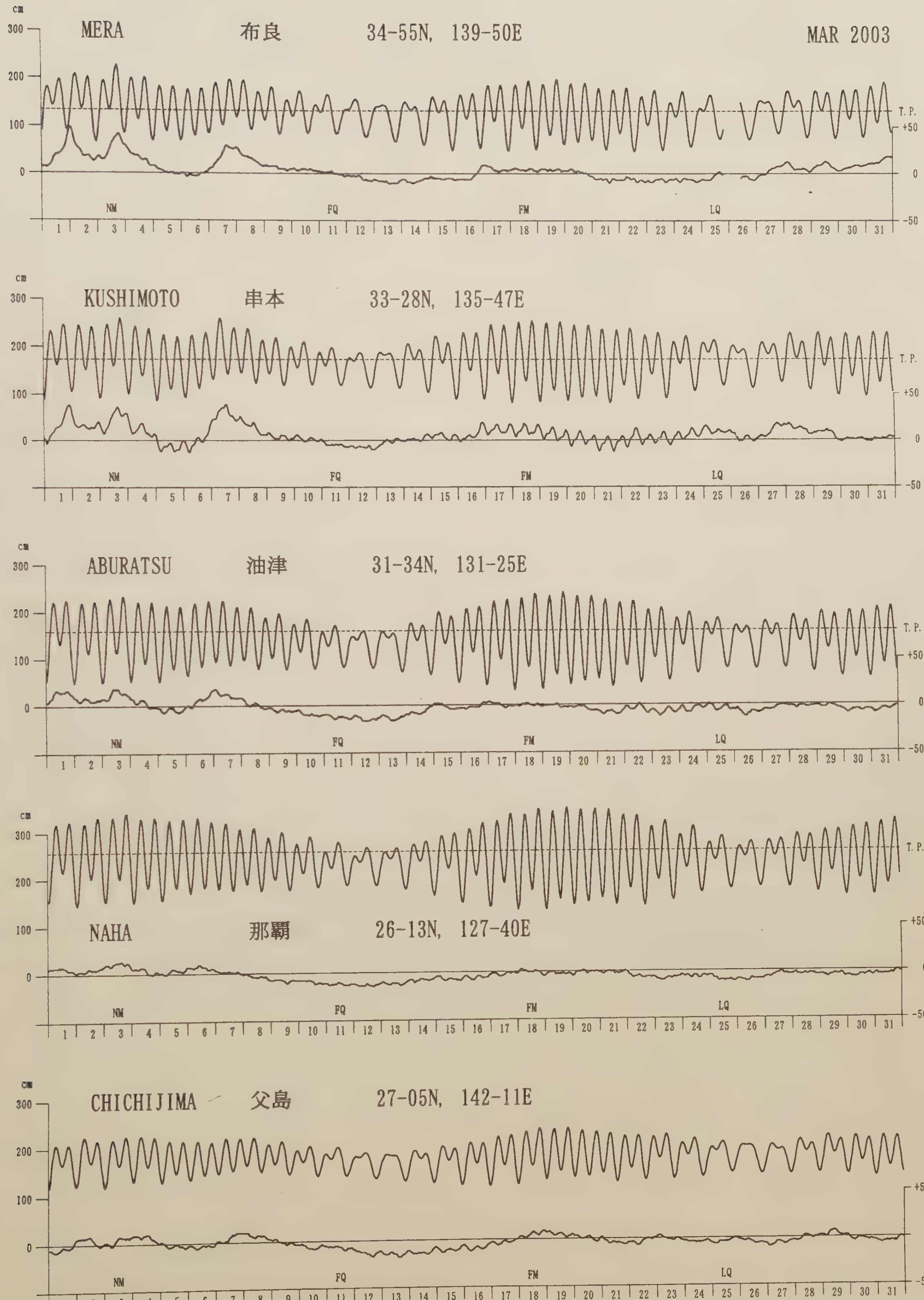


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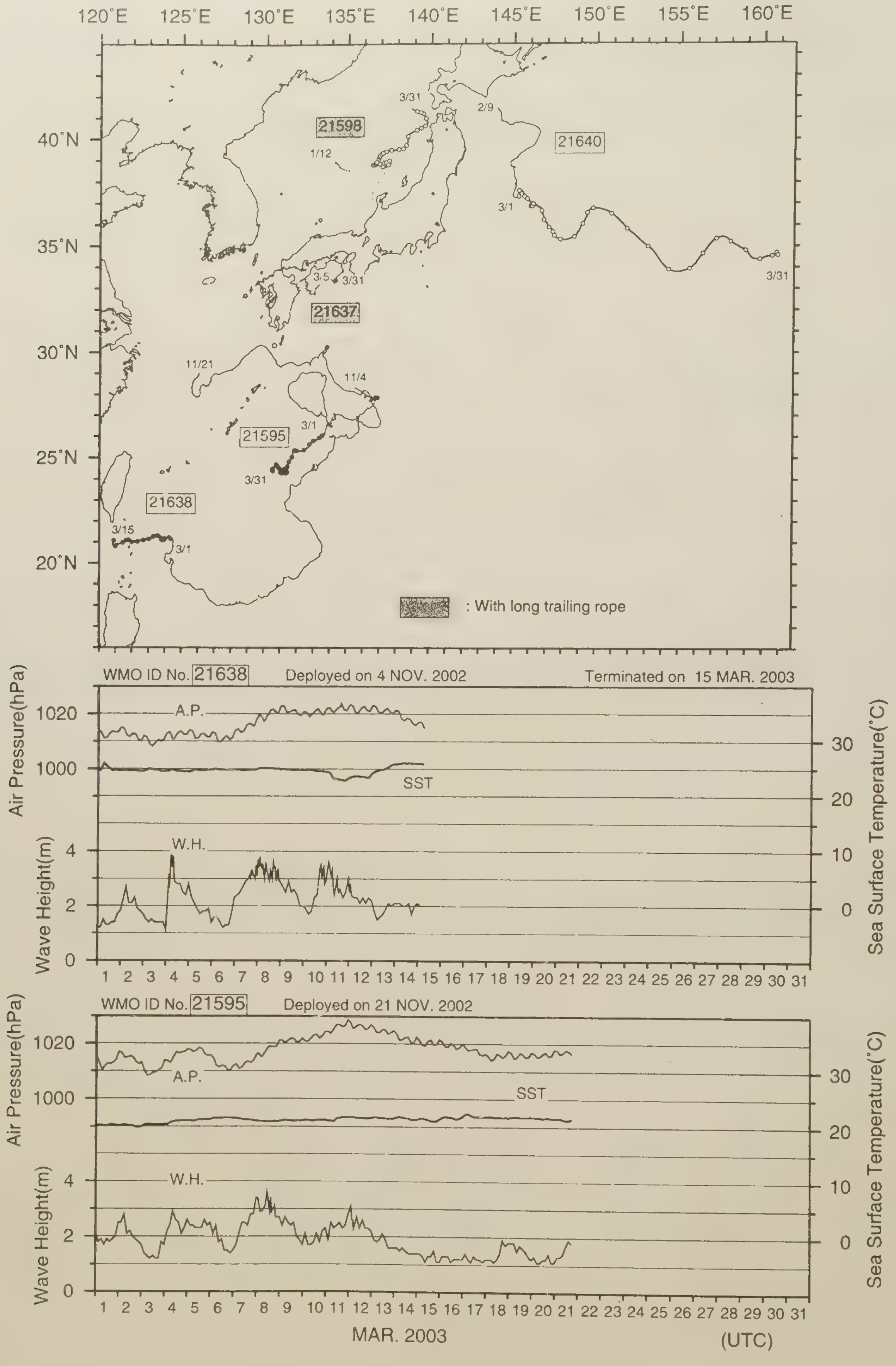
Fig. 15 Time series of hourly sea level observation (upper line) and its anomalies (lower line) at 9 stations of the JMA in the right panel.
Short term variations are removed from raw data.

NM: new moon, FQ: first quarter
FM: full moon, LQ: last quarter
T. P. : Mean sea level of Tokyo Bay (Tokyo Peil)



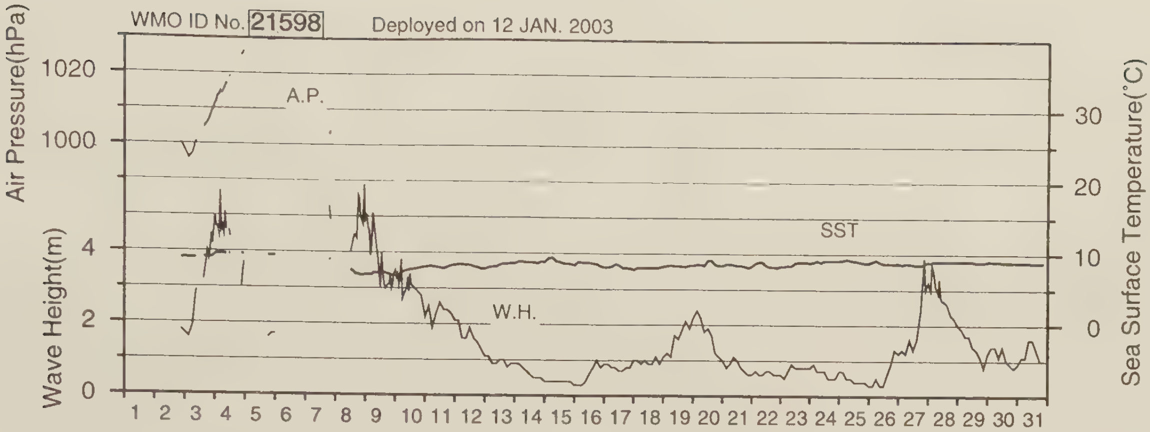


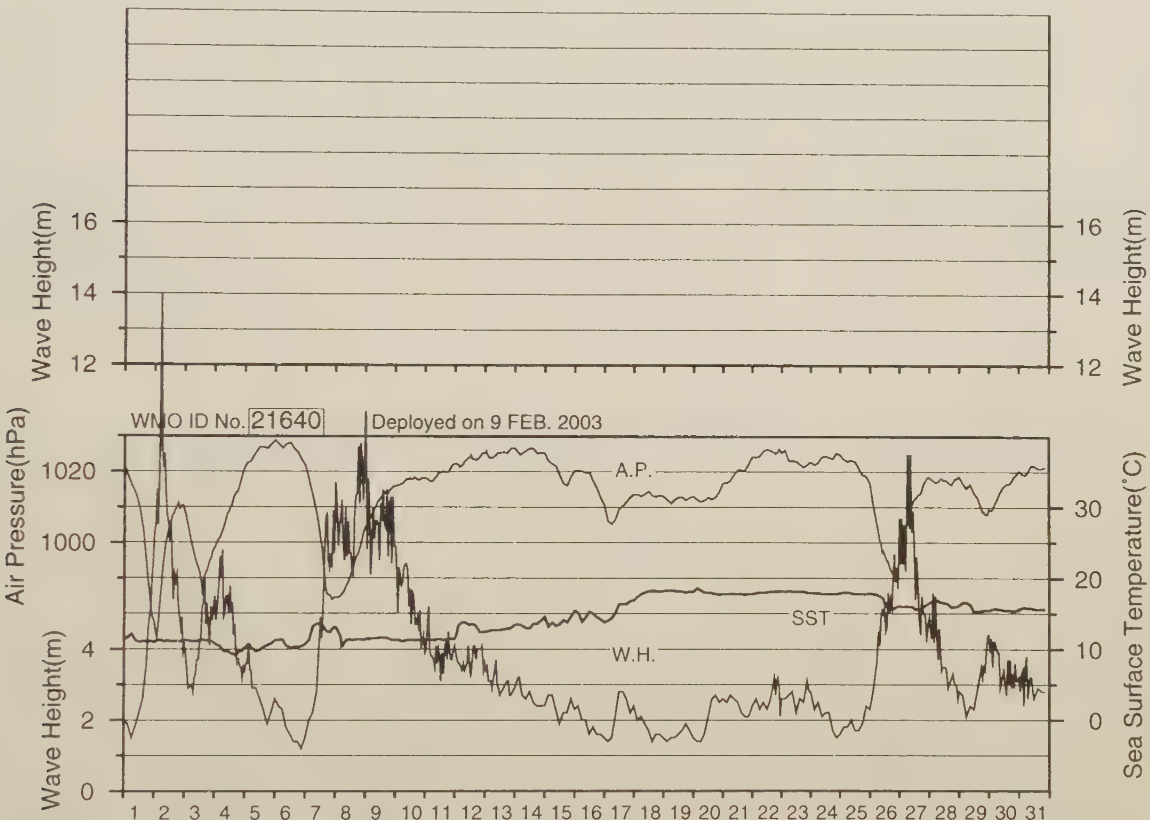
第15図 つづき
Fig. 15 continue

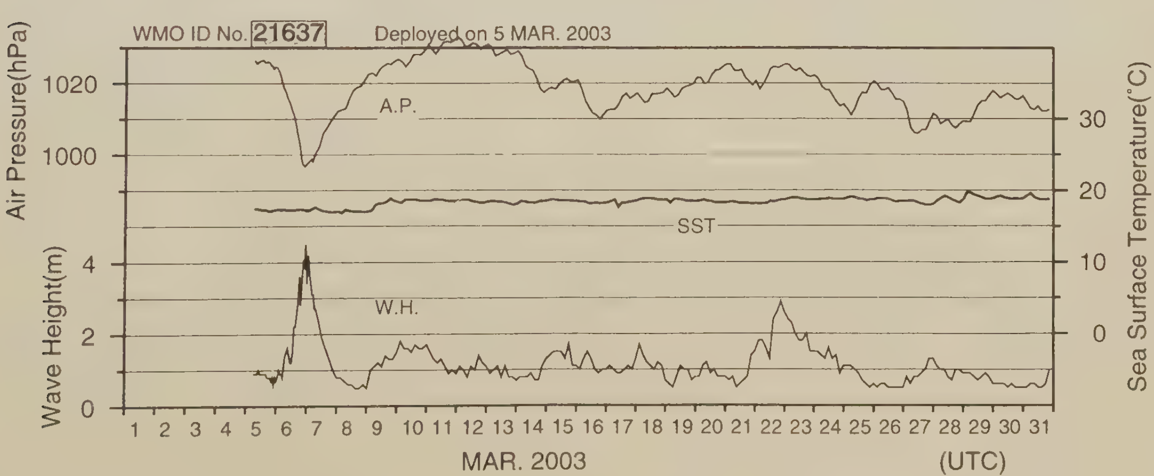


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Fig.16　Time series of JMA drifting buoy observation.
The upper panel shows paths of the buoys. Circles denote the position at 00h UTC everyday.
The lower panel shows time series of observation data.

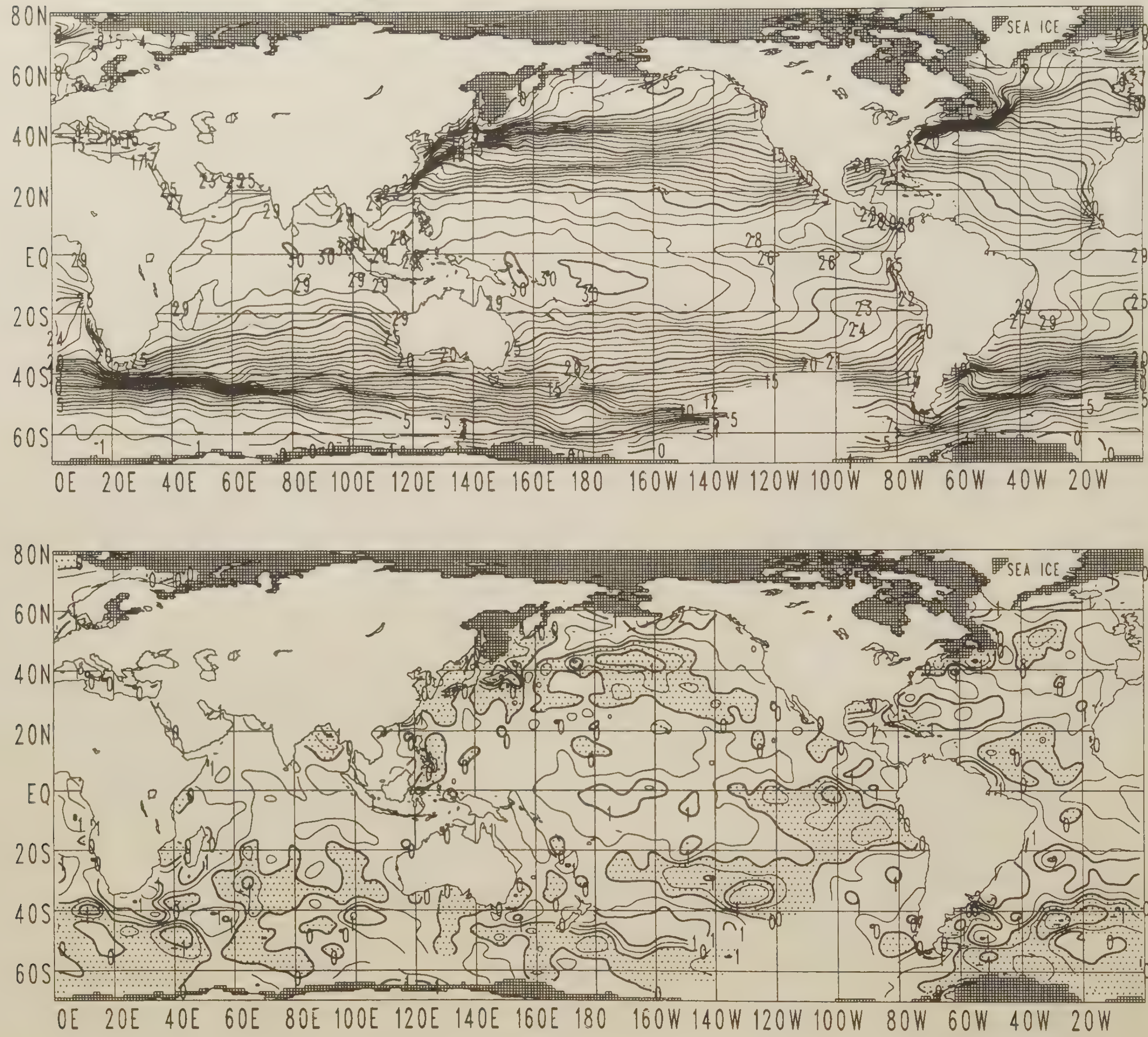






第16図 つづき
Fig.16 continue

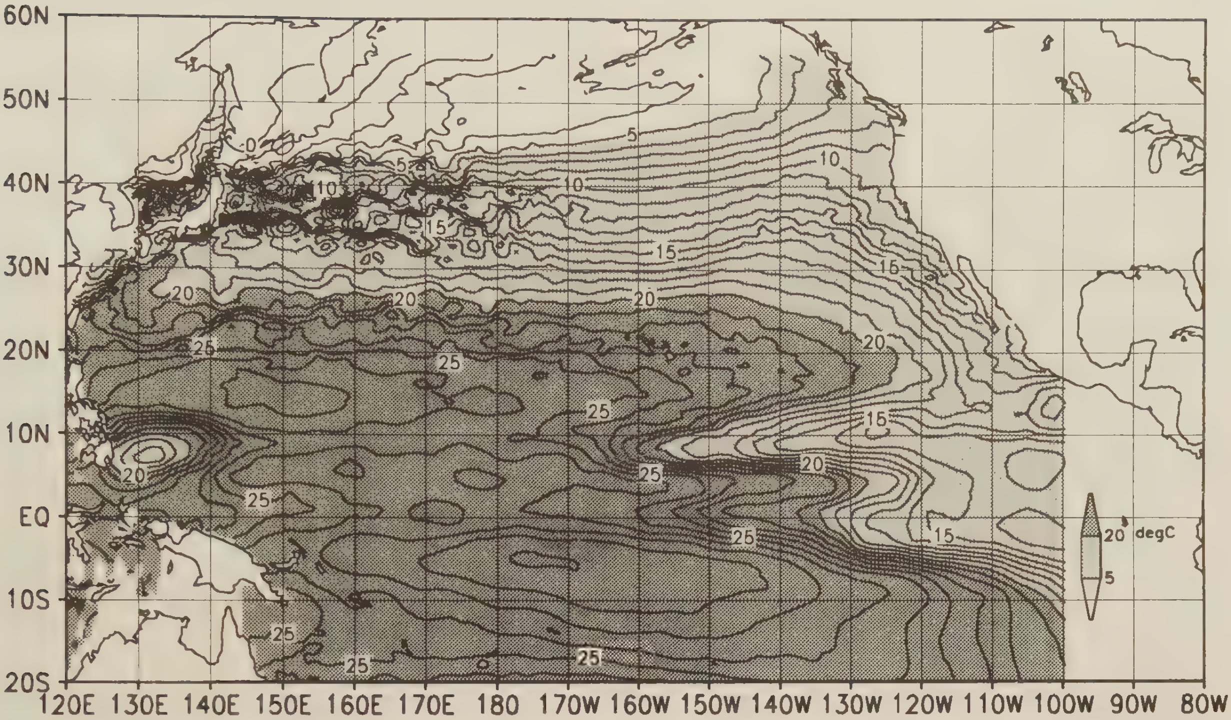
SST & Anomalies in the Global Ocean



第17図　全球月平均海面水温図（上）及び偏差図（下）（2003年 3月）

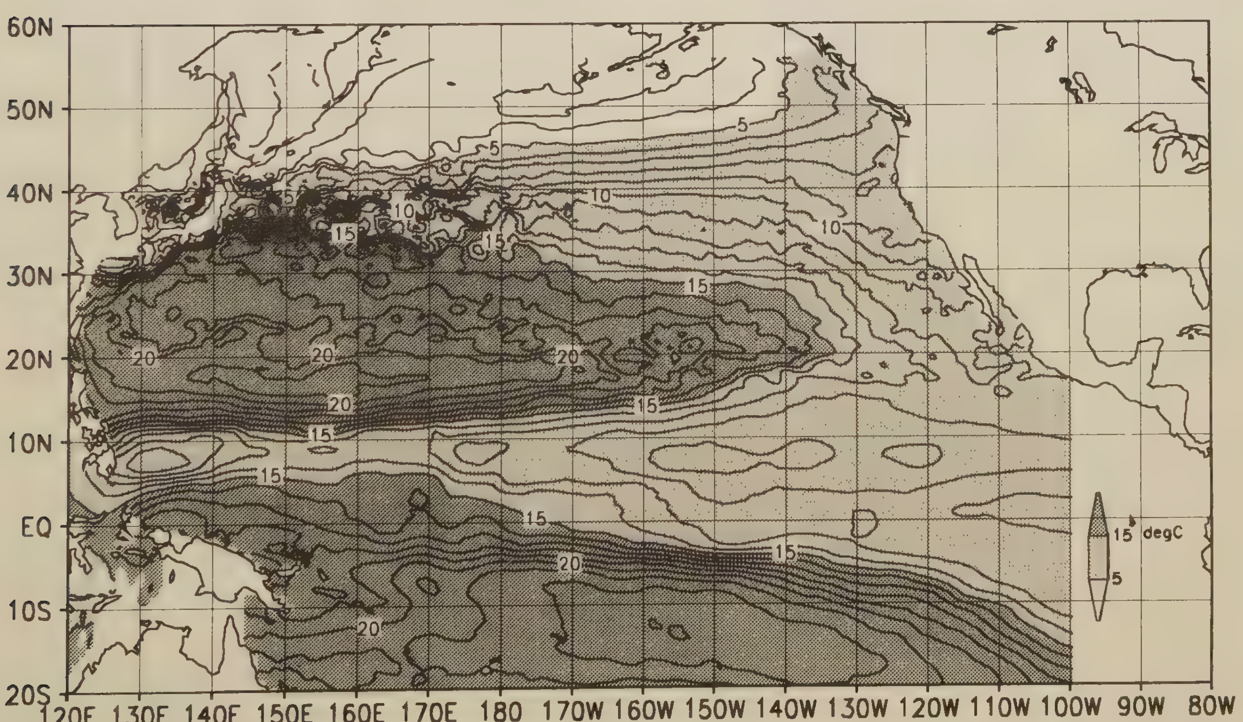
Fig. 17 Monthly mean SST over the global ocean (top) and anomalies (bottom) for MAR 2003. Anomalies are computed from the JMA climatology (1971-2000). Contour interval is 1°C (top) and additional anomaly contours of ±0.5°C are shown by thin lines. Negative anomalies are spotted. Maximum coverage of sea ice is shaded. Data sources for sea ice are U.S. National Ice Center (polar regions) and JMA (the Sea of Okhotsk).

100m / 200m Temperature in the Pacific Ocean



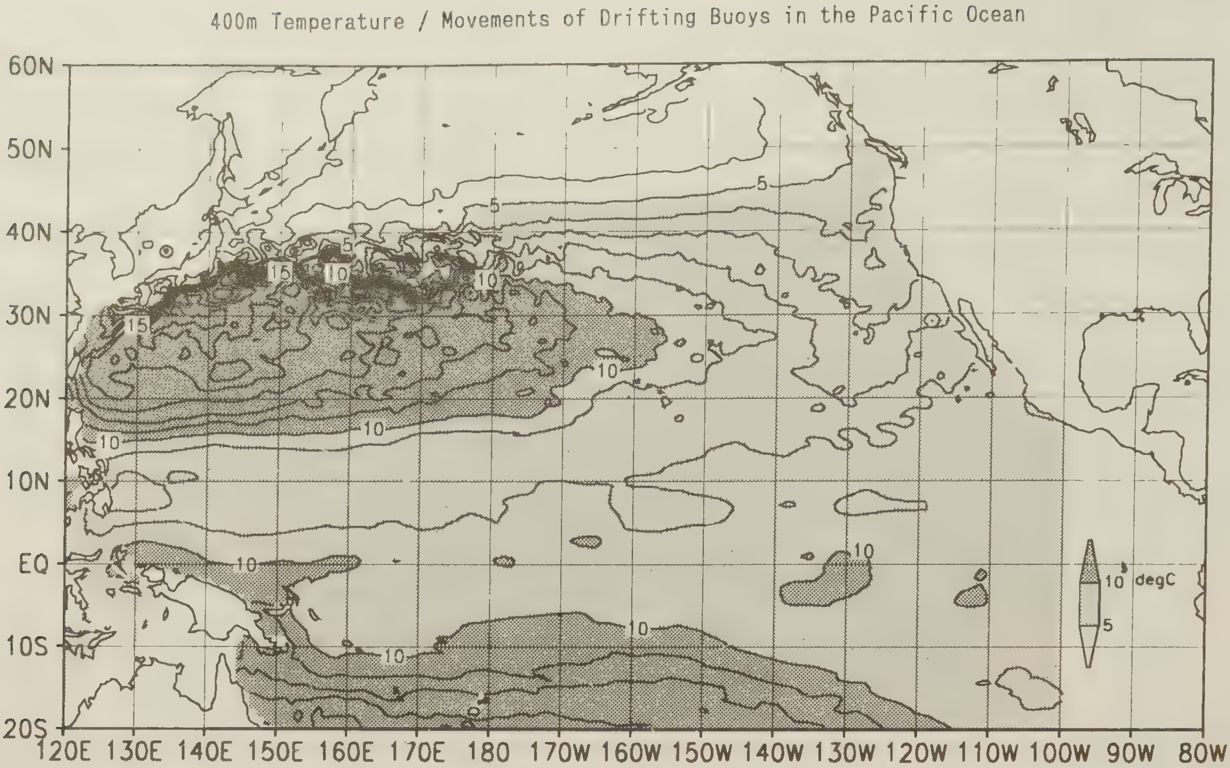
第 18 図　太平洋月平均表層水温図（深さ 100 m）（2003 年 3 月）
（海洋総合解析システムによる）

Fig. 18　Monthly mean subsurface (100 m) temperature in the Pacific Ocean for March 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



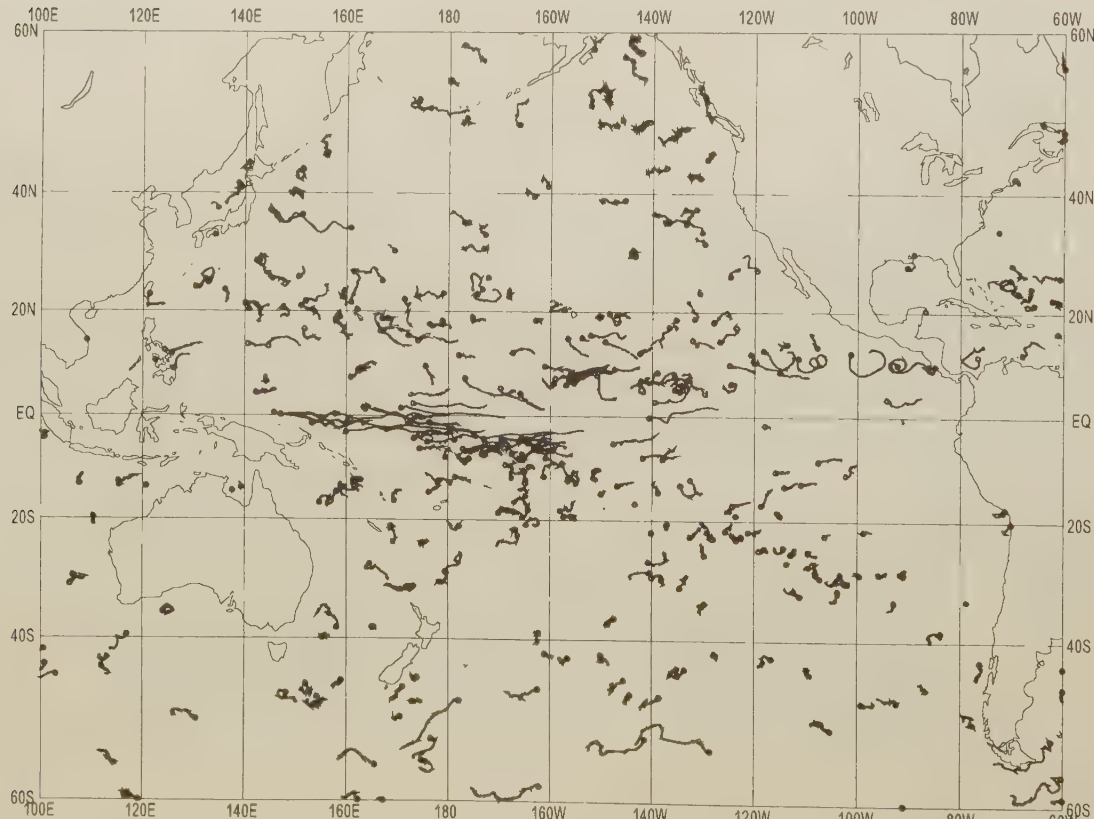
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（海洋総合解析システムによる）

Fig. 19　Monthly mean subsurface (200 m) temperature in the Pacific Ocean for March 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



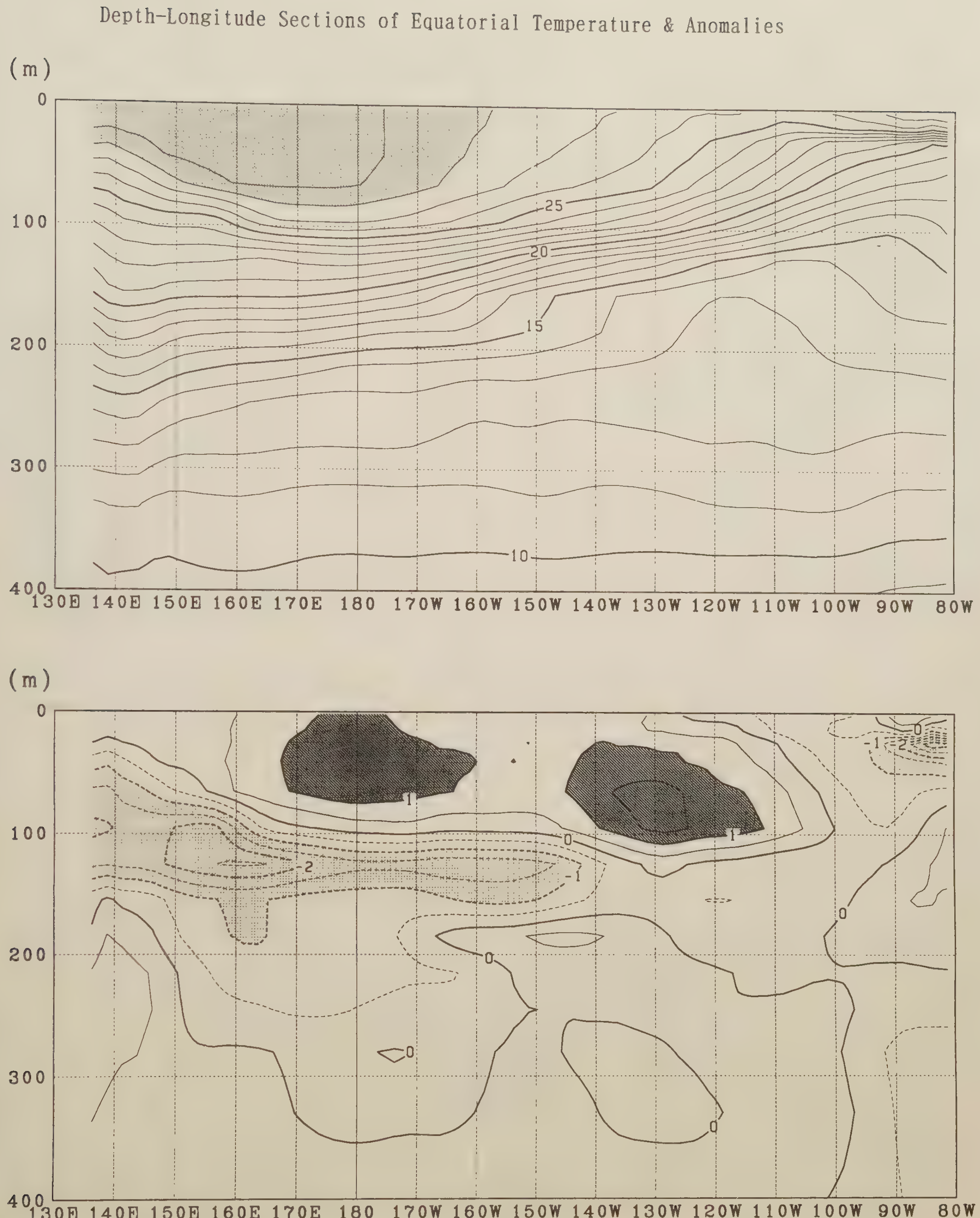
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（海洋総合解析システムによる）

Fig. 20　Monthly mean subsurface (400 m) temperature in the Pacific Ocean for March 2003. Contour interval is 1 ℃. (calculated by the Ocean Comprehensive Analysis System)



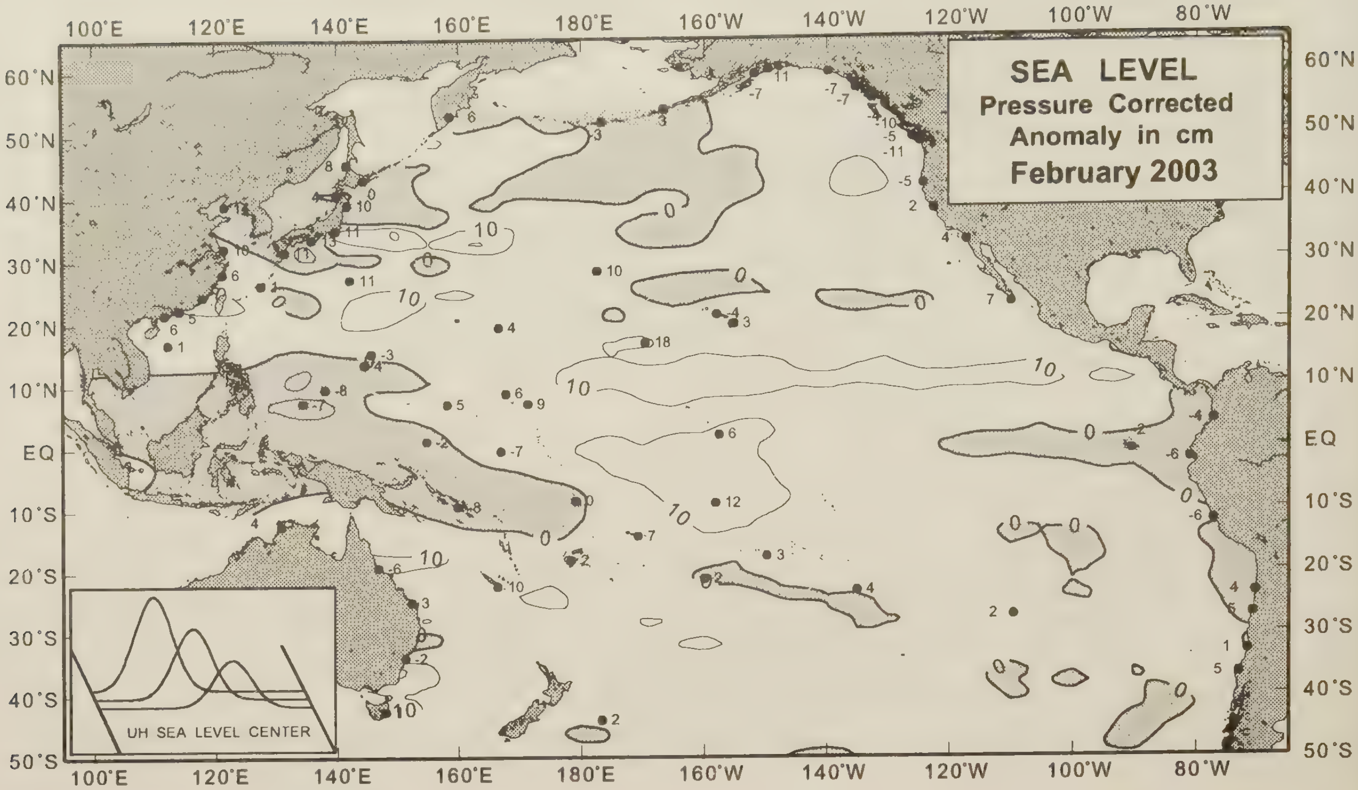
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Fig. 21　Trajectories of drifting buoys in the Pacific Ocean during March 2003. Each track is for one buoy. Small circles represent the last positions for the month.



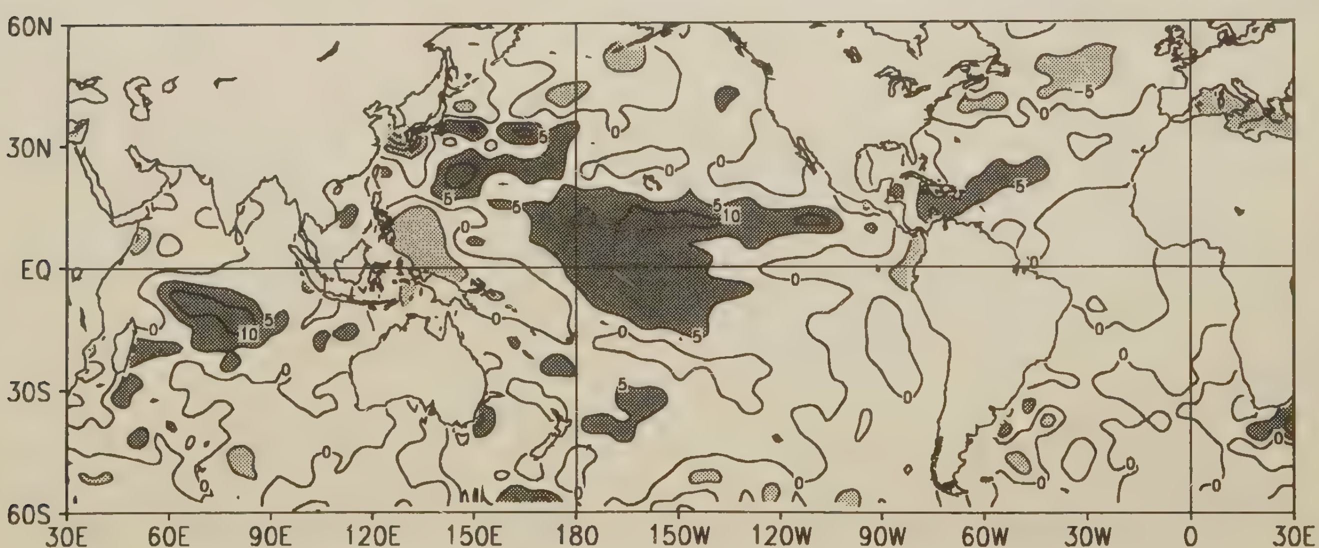
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Fig. 22 Depth-longitude sections of temperature (top) and anomalies (bottom) along the equator in the Pacific Ocean for MAR 2003. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (top) and 0.5°C (bottom). Values greater than 28°C in the top panel are shaded. In the bottom panel, values greater than 1°C are shaded and values less than -1°C are spotted. Anomalies are computed from 1987-2001 base period means.



第 23 図　太平洋月平均海面水位偏差図（2003 年 2 月）

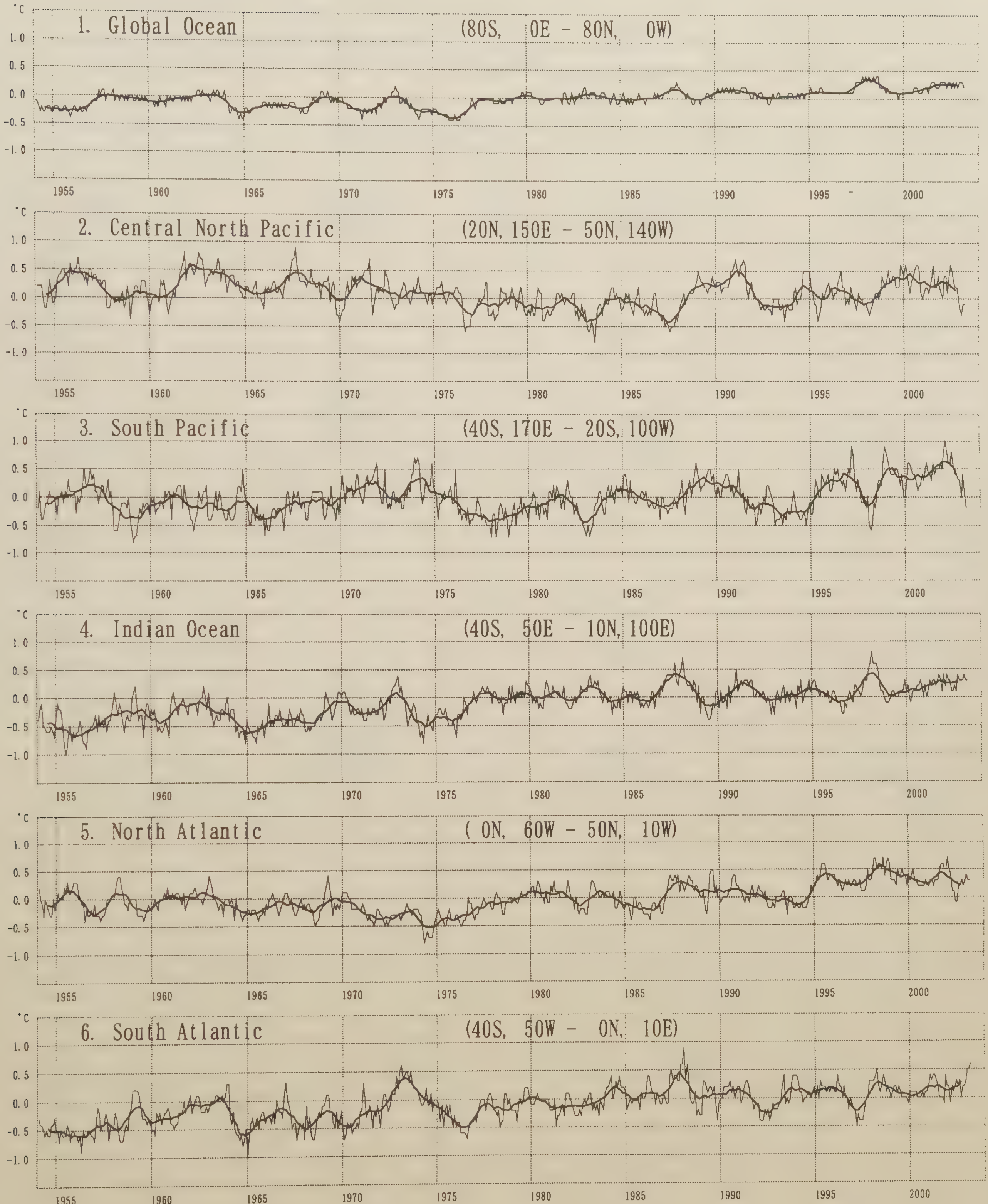
Fig. 23　Monthly sea level anomalies for February 2003 obtained from mean sea level (1993-2001) adjusted for atmospheric pressure. This figure is prepared by the SOC of ISLP-PAC, Department of Oceanography, University of Hawaii.



第 24 図　全球月平均海面高度偏差図（2003 年 2 月）

Fig. 24　Monthly sea surface height anomalies in the global ocean derived from the altimeter data of Jason-1 for February 2003. Contour interval is 5 cm. Positive anomalies exceeding +5 cm are shaded and negative anomalies exceeding -5 cm are spotted. Anomalies are computed from 1993-1998 base period means.

Long-term Variation of Monthly Mean SST Anomalies



第25図 海域平均海面水温偏差の長期変動

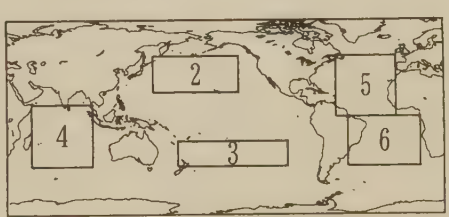
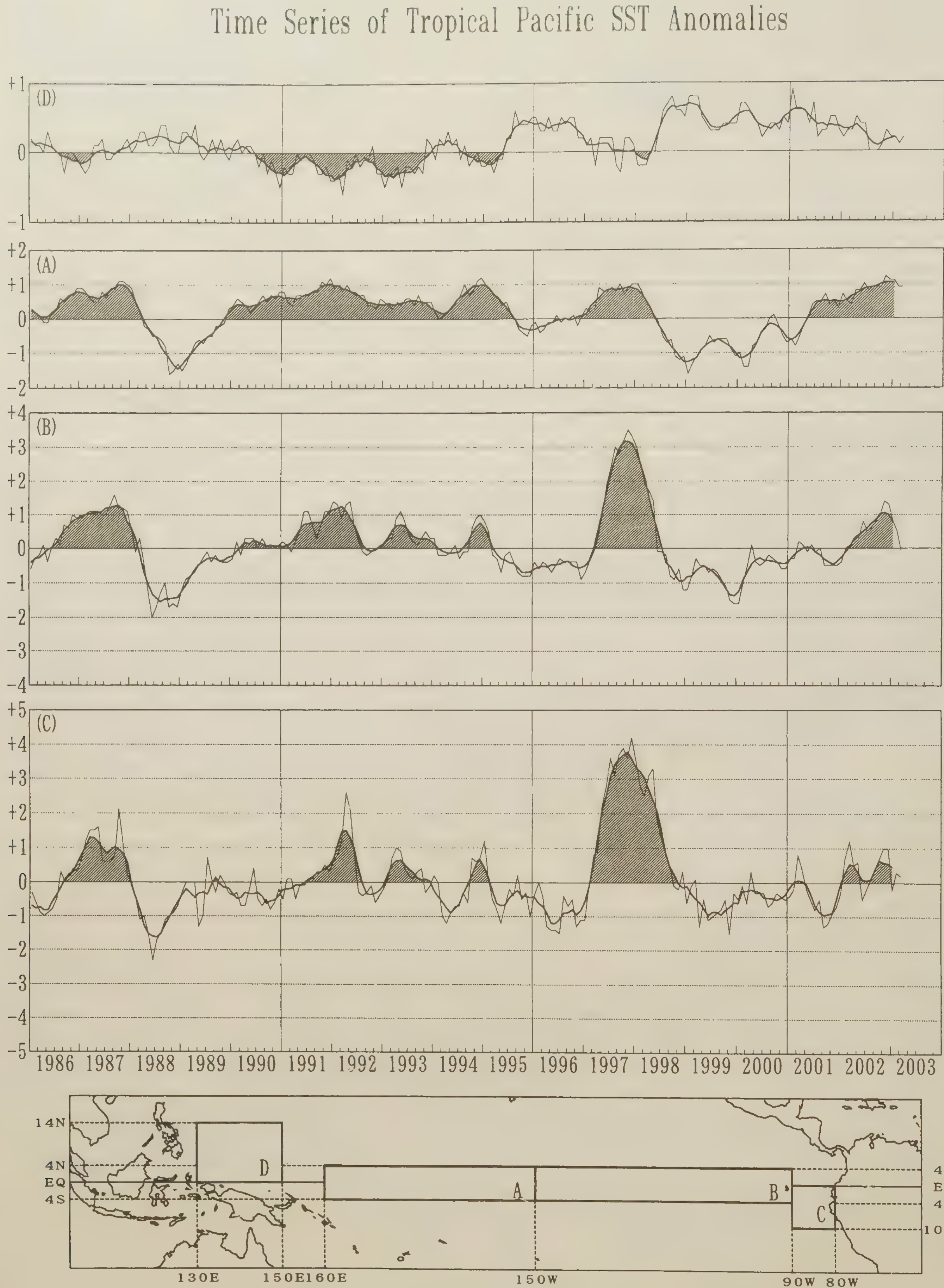


Fig. 25 Long-term variations of monthly mean sea surface temperature anomalies (°C) for the areas shown in the right panel. Anomalies are computed from the JMA climatology (1971-2000). Thin lines show the monthly mean and thick lines their 13-month running means.



第26図　太平洋熱帯域の海面水温偏差時系列図

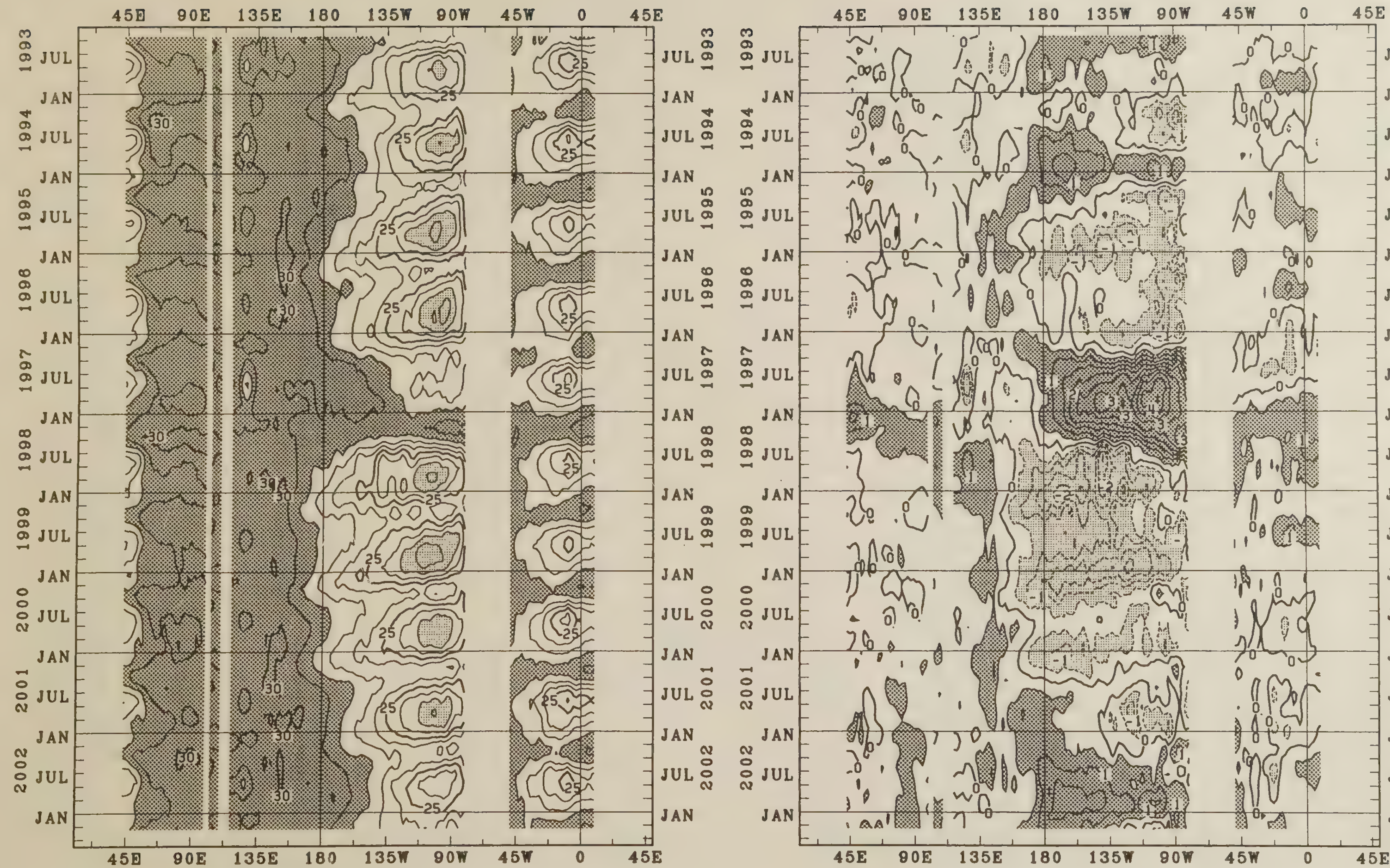
Fig. 26 Time series of monthly mean SST anomalies (°C) in the tropical Pacific Ocean for the areas indicated at the bottom panel. Thin lines show the monthly means and thick lines their 5-month running means. Positive anomalies (A, B, C) and negative anomalies (D) are shaded. Anomalies are computed from the JMA climatology (1971-2000).

Monitoring Indices in the Tropical Pacific

MONTH YEAR	SEA SURFACE TEMPERATURE AND ANOMALY (°C)								SOI	SEA LEVEL PRESSURE ANOMALY (hPa)	
	REGION D 14N-EQ 130E-150E		REGION A 4N-4S 160E-150W		REGION B 4N-4S 150W-90W		REGION C EQ-10S 90W-80W		SOI	TAHITI 17-33S 149-37W	DARWIN 12-24S 130-52E
JAN 01	29.4	0.9	27.4	-0.6	25.1	-0.3	24.1	-0.4	0.8	2.5	0.6
FEB 01	28.9	0.6	27.2	-0.8	26.0	-0.3	25.8	-0.2	1.0	-0.4	-3.2
MAR 01	29.1	0.6	27.6	-0.5	27.3	0.2	27.1	0.8	0.8	1.3	-0.2
APR 01	29.4	0.6	28.0	-0.2	27.3	0.1	25.8	0.4	0.1	-0.1	-0.3
MAY 01	29.7	0.4	28.7	0.1	26.8	-0.1	24.1	-0.2	-0.7	-0.2	0.9
JUN 01	30.1	0.7	28.9	0.4	26.3	0.1	22.4	-0.5	0.2	-0.2	-0.5
JUL 01	29.5	0.2	29.0	0.5	25.3	-0.1	21.1	-0.8	-0.2	-0.1	0.3
AUG 01	29.5	0.3	28.9	0.5	24.7	0.0	20.4	-0.5	-0.7	-0.9	0.1
SEP 01	29.6	0.3	29.1	0.7	24.2	-0.5	19.2	-1.3	0.1	-0.2	-0.4
OCT 01	29.9	0.5	28.8	0.4	24.2	-0.5	19.7	-1.2	-0.1	-0.9	-0.9
NOV 01	29.8	0.5	28.9	0.5	24.2	-0.5	20.9	-0.9	0.6	0.7	-0.4
DEC 01	29.3	0.3	28.5	0.3	24.5	-0.5	22.2	-0.7	-0.8	-1.2	0.3
JAN 02	28.7	0.2	28.7	0.7	25.0	-0.4	24.2	-0.3	0.3	1.3	0.7
FEB 02	28.6	0.3	28.5	0.5	26.3	0.0	26.7	0.7	0.7	1.5	-0.2
MAR 02	28.8	0.3	28.5	0.4	27.2	0.1	27.5	1.2	-0.2	0.4	1.0
APR 02	29.3	0.5	29.0	0.8	27.5	0.3	25.9	0.5	-0.1	0.1	0.3
MAY 02	29.7	0.4	29.4	0.8	27.2	0.3	24.9	0.6	-1.3	-1.1	0.7
JUN 02	29.8	0.4	29.5	1.0	27.0	0.8	22.4	-0.5	-0.4	-0.2	0.4
JUL 02	29.3	0.0	29.3	0.8	25.9	0.5	21.7	-0.2	-0.7	0.5	1.6
AUG 02	29.2	0.0	29.3	0.9	25.3	0.6	21.0	0.1	-1.2	-1.4	0.5
SEP 02	29.3	0.0	29.3	0.9	25.5	0.8	20.9	0.4	-0.5	-0.3	0.8
OCT 02	29.5	0.1	29.3	0.9	25.7	1.0	21.6	0.7	-0.5	-1.0	-0.3
NOV 02	29.6	0.3	29.6	1.2	26.1	1.4	22.8	1.0	-0.4	0.1	1.0
DEC 02	29.2	0.2	29.3	1.1	26.3	1.3	23.9	1.0	-1.0	-0.1	1.7
JAN 03	28.7	0.2	29.1	1.1	26.2	0.8	24.3	-0.2	-0.1	-0.1	0.2
FEB 03	28.4	0.1	28.9	0.9	26.8	0.5	26.3	0.3	-0.5	-1.5	-0.2
MAR 03	28.7	0.2	29.0	0.9	27.0	-0.1	26.5	0.2	-0.3	-0.2	0.5

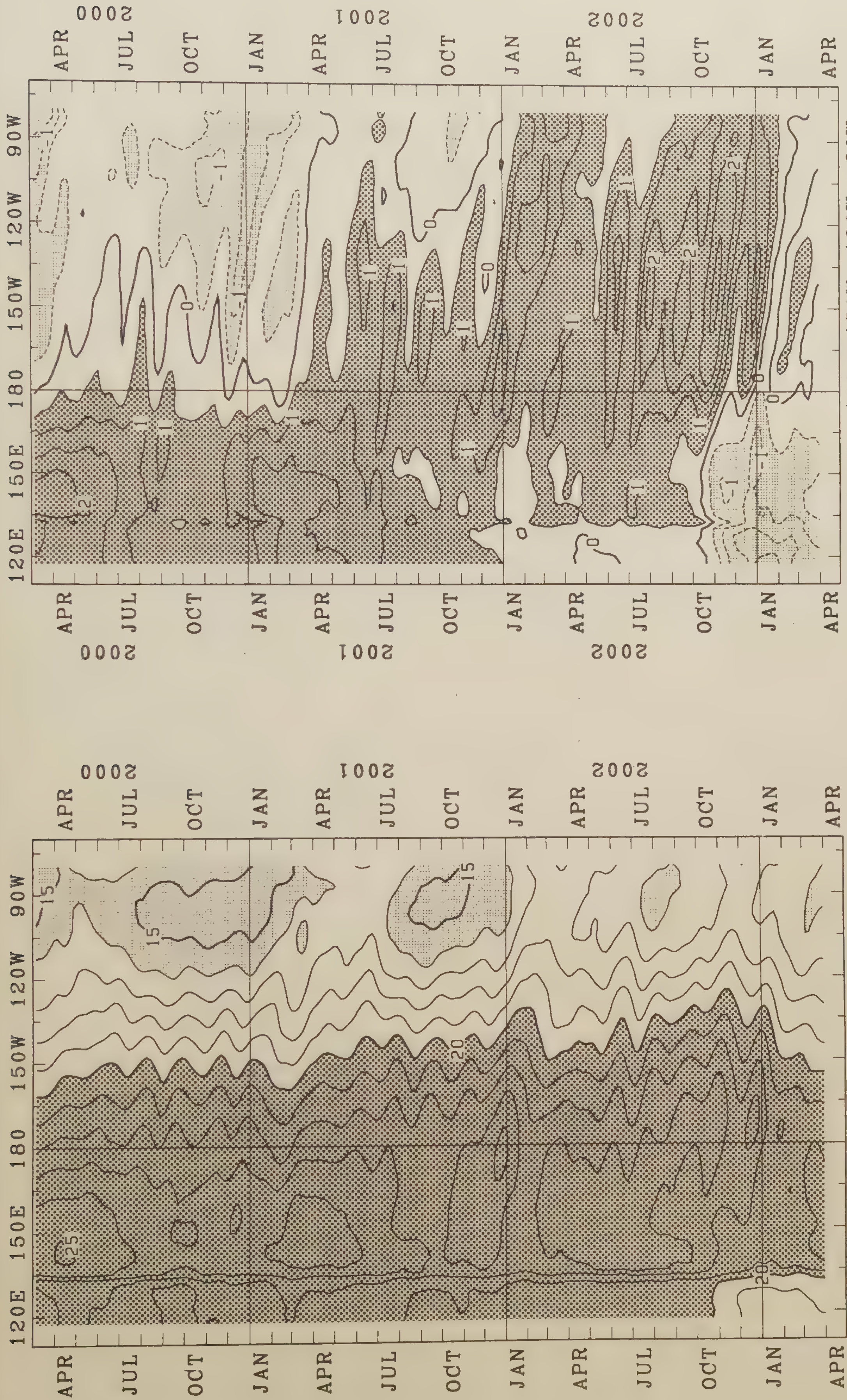
第1表　太平洋熱帯域の大気及び海洋の監視指数

Table 1 Atmospheric and oceanic monitoring indices in the tropical Pacific Ocean



第 27 図　赤道に沿った海面水温（左）および偏差（右）の時間-経度断面図

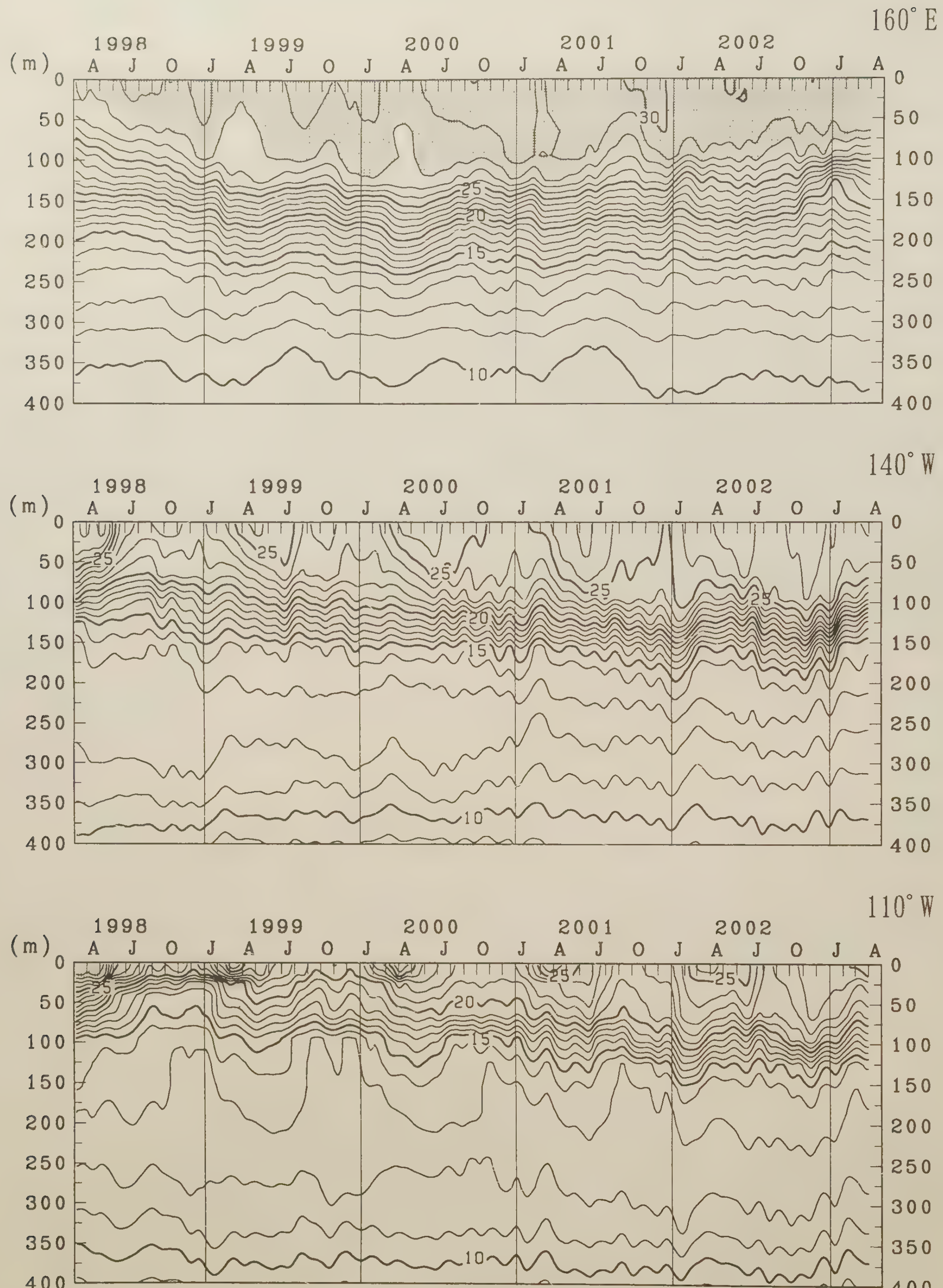
Fig. 27　Time-longitude sections of SSTs (left) and anomalies (right) along the equator (2 °N-2 °S) in the global ocean. Contour interval is 1 °C (left) and 0.5 °C (right). Values greater than 28 °C are shaded and values less than 23 °C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1971-2000 base period means.



第28図 太平洋の赤道に沿う海洋表層の貯熱量（左）及び偏差（右）の時間－経度断面図

Fig. 28 Time-longitude sections of ocean heat content in the upper 260 m along the equator (left) and anomalies (right) in the Pacific Ocean. Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C (left) and 0.5°C (right). Values greater than 20°C are shaded and values less than 16°C are spotted in the left panel. Dashed contours indicate negative anomalies in the right panel. Anomalies are computed from 1987-2001 base period means.

Time-depth Sections of Equatorial Subsurface Temperature



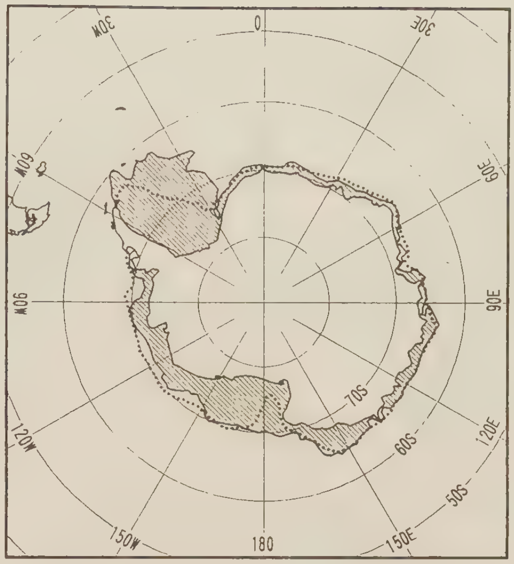
第29図　太平洋赤道域の表層水温の時間－深度断面図
（上：西部、中：中部、下：東部）

Fig. 29 Time-depth sections of equatorial subsurface temperature for the western Pacific (top, 160°E), the central Pacific (middle, 140°W) and the eastern Pacific (bottom, 110°W). Data are derived from the Ocean Data Assimilation System of JMA. Contour interval is 1°C. Values greater than 28°C are shaded.



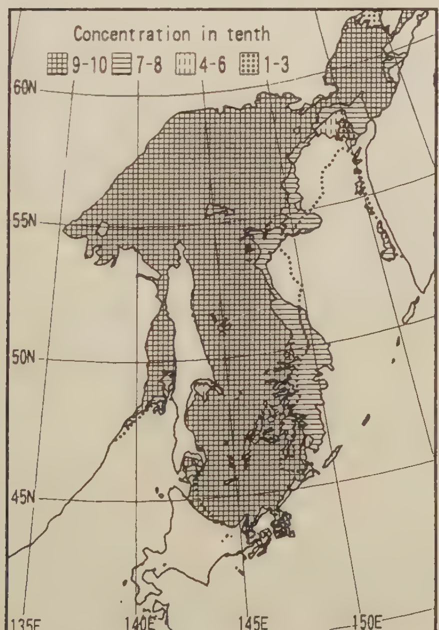
第30-1図　北極域の海氷図（2003年 3月14日）

Fig.30-1 Sea ice chart in the Arctic on 14 Mar. 2003.
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1972 through 1990.
The data source is the National Ice Center (USA).



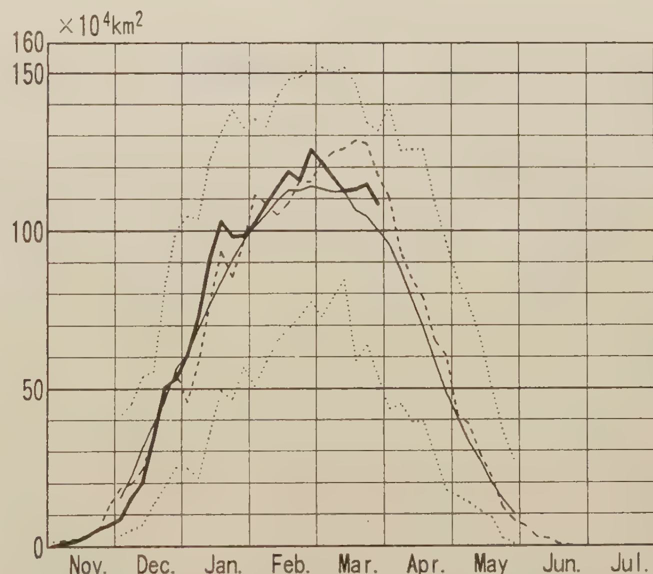
第30-2図　南極域の海氷図（2003年 3月14日）

Fig.30-2 Sea ice chart in the Antarctic on 14 Mar. 2003.
The shaded area represents the sea ice extent. The dotted line denotes the mean ice edge averaged for the period from 1973 through 1990.
The data source is the National Ice Center (USA).



第30-3図 オホーツク海の海氷図（2003年 3月15日）

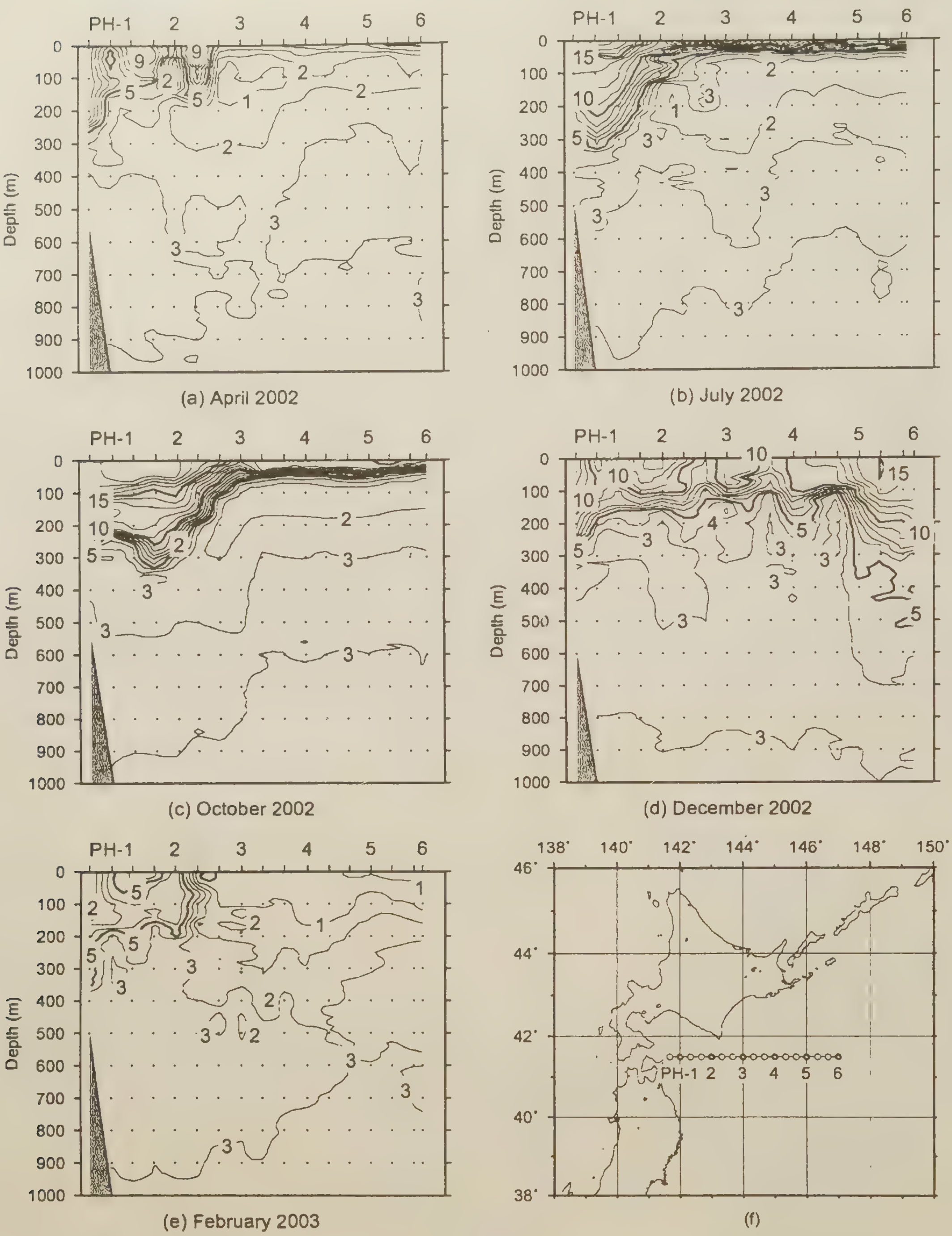
Fig.30-3 Sea ice chart in the Sea of Okhotsk on 15 Mar. 2003.
The dotted line denotes the mean ice edge averaged for the period from 1971 through 2000.



第30-4図 オホーツク海の海氷域面積

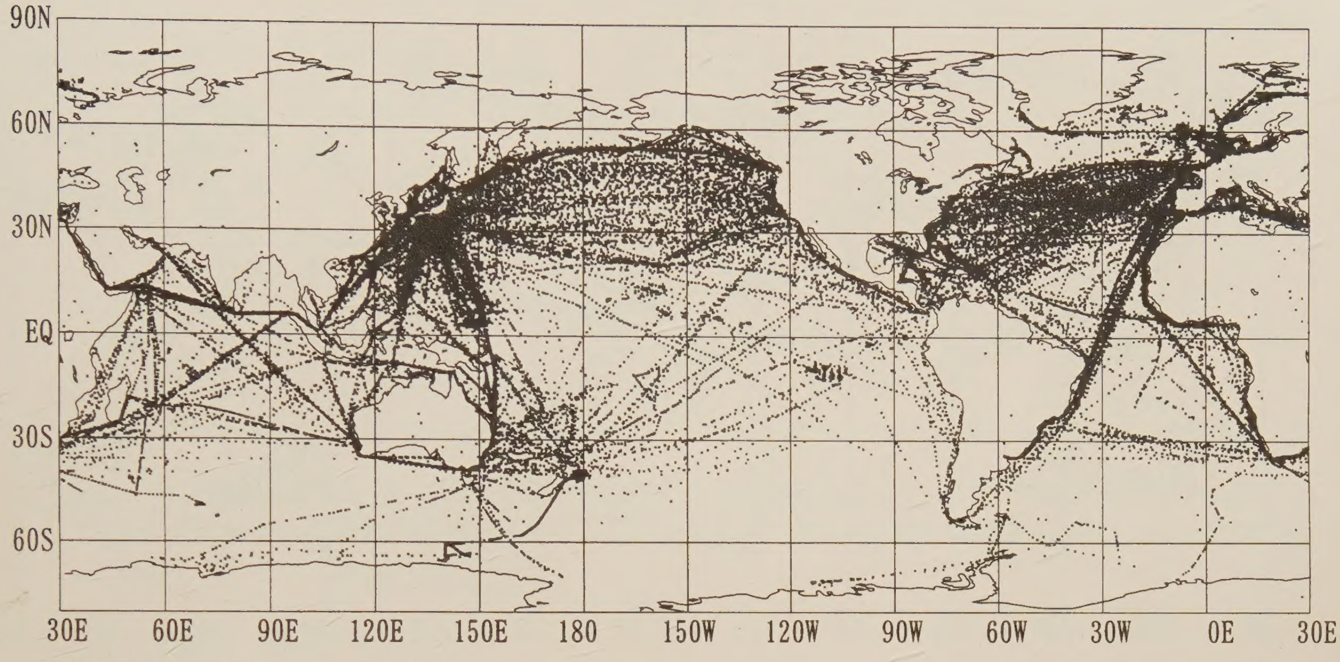
Fig.30-4 Time-series of 5-day sea ice area in the Sea of Okhotsk.

———— : current season (2002/2003)
———— : mean extent (1971-2000)
·········· : maximum or minimum extent (1971-2002)
- - - - - - : last season (2001/2002)

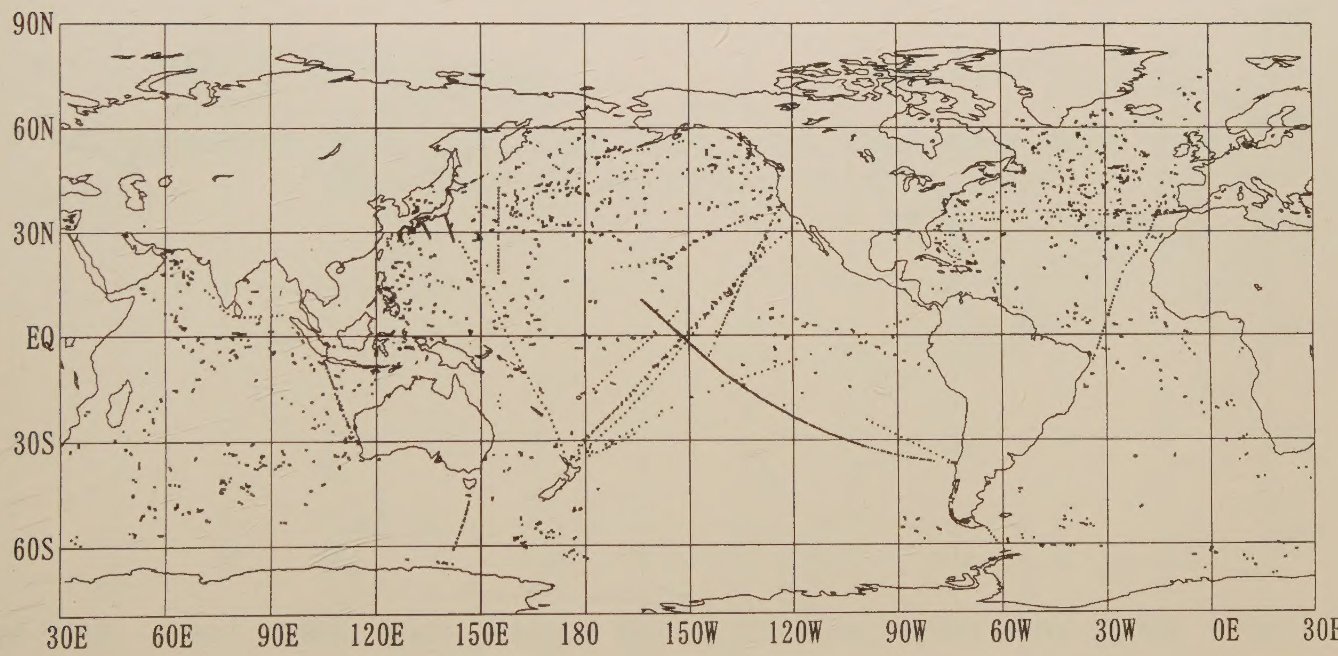


第31図 函館海洋気象台高風丸によるPH線に沿った水温鉛直断面図. (a) 2002年4月, (b) 2002年7月, (c) 2002年10月, (d) 2002年12月, (e) 2003年2月, (f) PH線の位置図.

Fig. 31 Vertical sections of temperature (℃) along the PH line observed by the R/V Kofu maru of the Hakodate Marine Observatory. (a) April 2002, (b) July 2002, (c) October 2002, (d) December 2002, (e) February 2003 and (f) Location of the PH line.



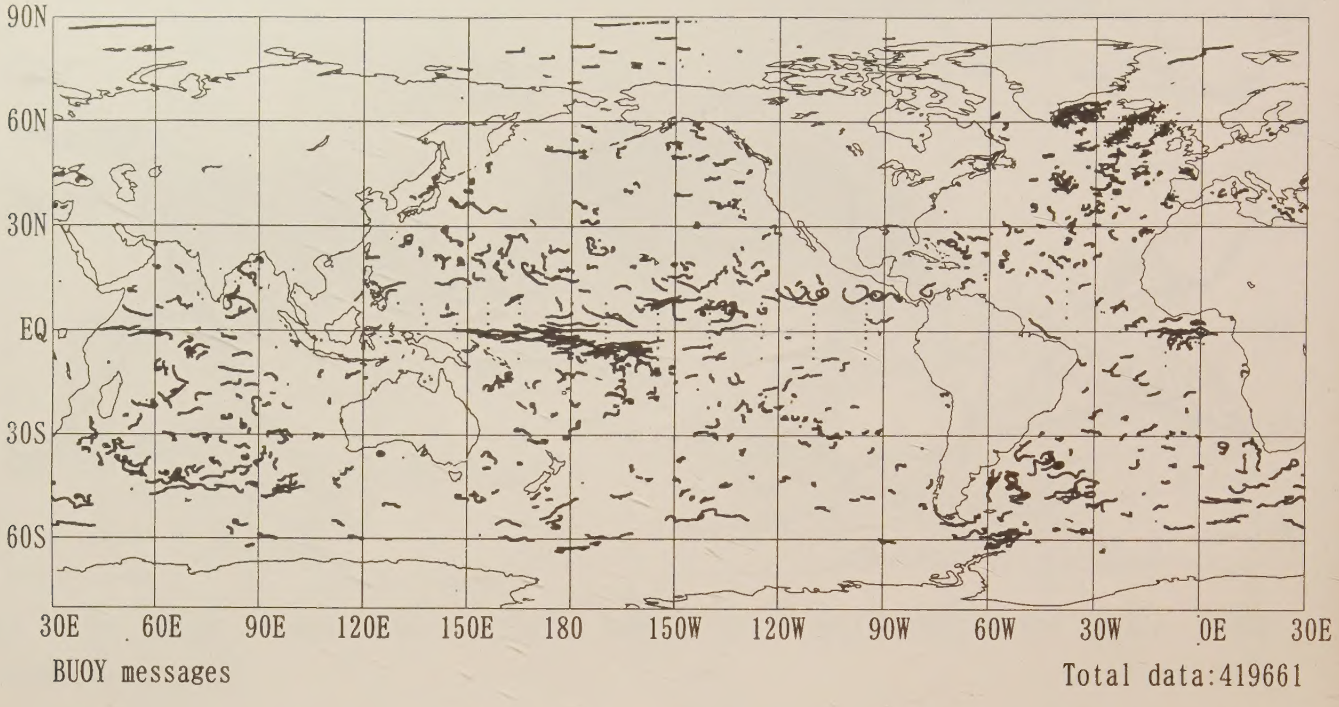
SHIP messages Total data:145079

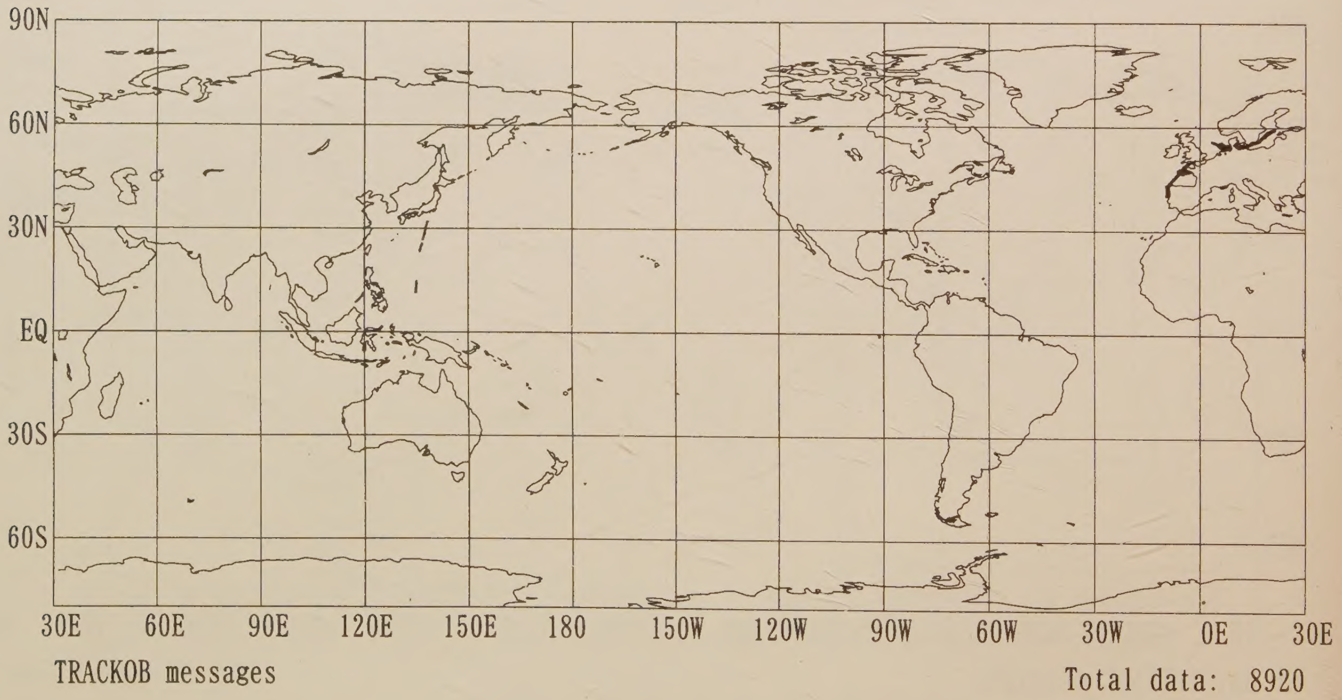


BATHY/TESAC messages Total data: 4509

第32-1図　測点分布図(2003年 3月)

Fig. 32-1 Geographical distribution of SHIP messages (SST data, top) and BATHY/TESAC messages (subsurface temperature data, bottom) for MAR 2003.





第32-2図　測点分布図(2003年 3月)

Fig. 32-2 Geographical distribution of BUOY messages (buoy drift and SST data, top) and TRACKOB messages (ship drift and SST data, bottom) for MAR 2003.

気　象　庁　海　洋　月　報

Monthly Ocean Report

March 2003 (No. 123)

本月報掲載の2003年3月のプロダクトには、気象庁が観測したデータ及びGTS（全球気象通信網）を通じて入手した国際気象通報式による通報のほか、下記の機関等から提供いただいたデータを使用しています。御礼申し上げます。

防衛庁、水産庁、海上保安庁

水産総合研究センター

海洋科学技術センター、（社）漁業情報サービスセンター

北海道大学、東北大学

水産試験場等（青森県、岩手県、宮城県、秋田県、山形県、茨城県、東京都、富山県、静岡県、愛知県、三重県、和歌山県、島根県、山口県、佐賀県、宮崎県）

（順不同）

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